
CHAPTER II.

REPORT

UPON

THE COLLECTIONS OF MAMMALS

MADE IN PORTIONS OF

NEVADA, UTAH, CALIFORNIA, COLORADO, NEW MEXICO, AND ARIZONA,

DURING

THE YEARS 1871, 1872, 1873, AND 1874.

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BY

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Compliments of

DR. H. C. YARROW,

Care of Smithsonian Institution,

Washington, D. C.



CHAPTER II.

REPORT UPON, AND LIST OF, THE MAMMALS COLLECTED IN 1871-'72-'73, AND '74.

The following report is based primarily upon the collections made during the years above noted by the naturalists and other members of the expedition, upon whose observations the field notes mainly rest. Besides Dr. Yarrow, Drs. Rothrock, Newberry, and Hoffman, and Messrs. Henshaw and Aiken, have each contributed to the general result. Our thanks are due to these gentlemen, to Prof. H. Allen for examination of the *Chiroptera*, to Mr. J. A. Allen for a like service rendered in the examination of the *Sciuridæ* and *Leporidæ*, and to Mr. D. G. Elliot, who obligingly gave us the use of much synonymy of the *Felidæ*, prepared for his forthcoming monograph of that family.

A few species, known to occur in the region explored, though not actually procured by the expedition, are introduced to complete an account of certain groups. The article on the *Chiroptera* represents a monographic essay on all the North American species of that order. The extensive bibliography of the species presented throughout will, it is thought, materially facilitate the study of the subject. Considerable technical matter is introduced, for which, as well as for the nomenclature, Dr. Coues is mainly responsible. The classification adopted is in close accord with the views of Prof. Theodore N. Gill, whose "Arrangement of the Families of Mammals," published in the Smithsonian Miscellaneous Collections, seems to us to be, upon the whole, the most philosophical among the many which have been proposed.

Lists of the specimens actually collected are rendered in tabular form. The collections constitute a large representation of the mammalian life of

the regions explored, and serve to show that the operations of the expeditions in this department of science are not behind those which have been conducted in other fields of research in interest and importance. Although the collection contains no novelties, it includes a fair proportion of the rarer and less generally known species, among which the peculiar deer of Arizona and Sonora may be particularly noted. It also extends the previously known range of some species, like *Lepus bairdii*, *Mustela americana*, and *Putorius longicauda*, not hitherto recognized as occurring in so low a latitude. The collections were made at points too remote to permit the basing upon them of any very nice zoö-geographical conclusions; but they may be said to bear out the general characters by which the southern portion of the Middle Faunal Province, as defined by Baird, is recognized. An almost entire absence of Mexican types is noteworthy, taken in connection with the unexpectedly large number of sub-tropical birds, which the indefatigable labors of Mr. Henshaw have shown to inhabit the same region. Much, however, remains to be done in this part of the country before our knowledge of its *Mammalia* reaches the point already gained in ornithology.

The specimens collected are deposited in the National Museum at the Smithsonian Institution, Washington, with the exception of some of the osteological material, which has been presented to the Army Medical Museum.

MONODELPHIA EDUCABILIA.

FERAE.

FAM. FELIDÆ.

Genus FELIS, L.

FELIS CONCOLOR, L.

Panther; Cougar; Rocky Mountain Lion.

- Felis concolor*, LINN., Mantissa, 1771, 552.—ERXL., Syst. Reg. Anim., 1777, 511, sp. 17.—BODD., El. Anim., 1784, 90.—GMEL., Syst. Nat., 1788, vol. i, pt. i, 79, sp. 9.—SCHREB., Säugth., 1778, th. iii, 394, tab. civ.—F. CUV., Hist. Nat. des Mamm., 1829, vol. ii, pl. 143.—CUV., Ossem. Foss., 1825, vol. iv, 40.—TEM., Mon. Mammif., 1827, 134.—WILS., Illust. Zoöl., 1831, pl. i.—MAXIMILIAN, Beitr. Naturg. Brasil., 1826, band ii, 358.—REUG., Zoöl. Journ., 1835, vol. v, 476.—FULLER, P. Z. S., 1836, 62.—AZARA, Nat. Hist. Quad. Parag., 1838, 207.—SWAINS., Anim. Menag., 106.—RICH., Zoöl. Beechey's Voy. Mam., 1839, 6.—GRIFF., Anim. King., 1827, 436.—BURM., Ueber. Thier. Bras., 1854, 88.—MURR., Geog. Distr. Anim., 1866, 100.—GERV., Nat. Hist. Mamm., 1855, 89.—BLAINV., Osteog., 1839-64, vol. ii, atl. vi, pls. xi, xiv.—FISCH., Zoogn. 1814, 223, sp. 5.—*Id.*, Syn., 1829, 197.—JARD., Nat. Libr., vol. xvi, 124, pls. iv, v.—DESM., Mammal., 1820, 218, No. 336, pl. 94, fig. 102.—D'ORBIG., Voy. Amér. Mérid., 1847, 21 (Mamm.).—BARTL., P. Z. S., 1861, 141.—CUNNINGH., P. Z. S., 1868, 185.—SCLAT., P. Z. S., 1868, 624.—TEM., Mon. Mamm., 1827, vol. i, 134, et app. 256.—LESS., Man. Mamm., 1827, 190, sp. 507.—COOP. & SUCK., Nat. Hist. Wash. Terr., 1859, 74, 108.—BAIRD, U. S. & Mex. B. Sur., 1859, 5.—DEKAY, Nat. Hist. N. Y., 1842, 47.—BAIRD, U. S. P. R. R. Expl. Ex., 1857, vol. viii, 83.—HARL., Faun. Amer., 1825, 94.—WAGN., Suppl. Schreb., 1841, 461.—AUD. & BACH., Quad. N. Am., vol. ii, 1851, 305, pls. xevi, xevii (8vo ed.).—LESS., Nouv. Tab. Règn. Anim., 1842, 56, sp. 512.—NEWB., P. R. R. Rep., vi, 1857, 36.—MARCY, Rep. Expl. Red River, 1852, 200.—WOODH., Sitgr. Rep. Zuñi & Colorado, 1854, 47.—COUES, Am. Nat., i, 1867, 286.—*Id.*, Proc. Acad. Nat. Sci. Phila., 1867, 133.—ALL., Bull. Essex Inst., vi, 1862, 53, 58.—*Id.*, Bull. M. C. Z., ii, 1871, 168.
- Felis discolor*, GMEL., Syst. Nat., 1788, vol. i, pt. i, 79, sp. 12.—SCHREB., Säugth., 1778.—FISCH., Zoogn., 1814, 223, sp. 6.—LESS., Man. Mamm., 1827, 190, sp. 509.
- Felis puma*, SHAW, Gen. Zoöl., 1830, vol. i, 358, pl. cxxxix.—MOLINA, Saggio Stor. Nat. Chili, 1810, 245, sp. 8.
- Leopardus concolor*, J. E. GRAY, P. Z. S., 1867, 265.—*Id.*, Cat. Carn. Mamm., 1869, 12.—*Id.*, Cat. Mamm. Brit. Mus., 1842, 41.
- Puma*, PENN., Hist. Quad., 1793, 289, sp. 189.—*Id.*, Arct. Zoöl., i, 1784, 49.
- Felis nigra*, GRIFF., Syn., sp. 444(?).—ERXL., Syst. Reg. Anim., 1777, 512, sp. 8.
- Black Puma*, JARD., Nat. Libr., vol. xvi, 135, pl. 5.

Felis unicolor, LESS., Man. Mamm., 1827, p. 190, sp. 503.

Panthera concolor, FITZIN., Sitzg. Akad. Wiss. Wien, 1869, lix, 629.

Panthera concolor niger, FITZIN., Sitzg. Akad. Wiss. Wien, 1869, lix, 634.

Puma concolor, J. E. GRAY, Ann. & Mag. Nat. Hist., 1874, p. —.

Gouazoura, AZARA, Nat. Hist. Paraguay, i, 133.

Le Cougar, CUV. & ST. HIL., Hist. des Mammif., ii, 1819, p. —.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
B 8	<i>F. concolor</i>	Triplet Mountains, Arizona	Sept., 1873	Dr. O. Loew .	Cranium.
B 9	.....do . . . . .	.....do . . . . .	.....do	J. L. McGee .	Skin and cranium.

This species, the second in size of the North American cats, is tolerably common in the mountains of Colorado, New Mexico, and Arizona, as observed by different members of the expedition. It ranges from 50° or 60° north latitude to the most southern part of the South American continent.

In certain localities in New Mexico and Arizona, it wages a terrible warfare upon wild turkeys, destroying hundreds of them, and depopulating their former breeding places to such an extent that in a few years the race will have become almost extinct in this region, if measures are not taken to prevent the wholesale slaughter.

The crania and skins of two fine specimens were secured on the southern slope of the Triplet Mountains, near the Gila Valley, close to the San Carlos Indian reservation in Arizona.

A large species of cat was frequently heard during the night howling near the camps in Eastern and Middle Utah, supposed to be the above; but no specimens were secured. The inhabitants of the surrounding country state that they are not numerous.

The following measurements were taken from a full-sized female, in the flesh, and indicate a fair average:

From nose to end of tail	82.00 inches.
Head, over the frontal curve	9.50 inches.
Head and body, to root of tail	50.00 inches.
Tail	32.00 inches.
Stature at shoulders	29.00 inches.
Fore leg and foot, from elbow	15.50 inches.
Sole of hind foot	11.00 inches.
Close girth of chest	27.00 inches.

Weight, after evisceration, 82 pounds; probably 100 pounds gross.

Though not so large an animal as the Jaguar, *F. onça*, the present species stands as high or higher, owing to the much greater relative length of the legs. Kittens are spotted, as usual in this family; but the adults are nearly uniformly tawny, whitening underneath and about the face, where there are blackish markings, and with a black tip to the tail.

Genus LYNX, Raf.

LYNX CANADENSIS, (Desm.) Raf.

Canada Lynx.

Lynx, PENN., Hist. Quad., 1793, 301, sp. 203.

Felis canadensis, DESM., Nouv. Dict. d'Hist. Nat., 1816, 108.—*Id.*, Mam., 1820, 224, No. 346.—GAPPER, Zoöl. Journ., 1835, vol. v, 203.—SWAINS. & RICH., Faun. Bor.-Am., vol. i, 1829, 101.—MURR., Geog. Distr. Mam., 1866, 101.—JARD., Nat. Libr., vol. xvi, 259, pl. xxxiii.—LESS., Man. Mam., 1827, 191, sp. 513.—HARLN., Faun. Am., 1825, 98.—GRIFF., Anim. King., 1827, vol. v, 174.—FISCH., Syn. Mam., 1829, 213, sp. 31.—LESS., Nouv. Tab. Règn. Anim., 1842, 57, sp. 548.—GERV., Hist. Nat. Mam., 1855, 92.

Felis borealis, TEMM., Mon. Mam., 1847, vol. i, 109, app. 251.—LESS., Man. Mam., 1827, 184, sp. 490.—*Id.*, Comp. Buff., 1839, vol. i, 411.—WAGN., Suppl. Schreb., 1841, vol. ii, 519.—BLYTH, J. A. S. B., 1842, vol. xi, pt. ii, p. —.

Le Lynx du Canada, CUV., Ossem. Foss., 1825, vol. iv, 443.—BUFF., Suppl., vol. iii, pl. xlv.

Le Lynx de Mississippi, BUFF., Suppl., vol. vii, pl. liii.

Lyncus canadensis, GRAY, Cat. Mam. Brit. Mus., 1842, 46.—*Id.*, P. Z. S., 1867, 276.—*Id.*, Cat. Carn. Mam., 1869, 37, sp. 3.

Lyncus borealis, DEKAY, Nat. Hist. N. York, 1842, 50, pl. x, fig. 2.

Lynx canadensis, BAIRD, U. S. P. R. R. Expl. Exp., 1857, vol. viii, 99.—RAF., Am. Month. Mag., 1817, vol. ii, 46.—AUD. & BACH., Quad. N. Am., 1849, vol. i, 136, pl. xvii.

The Canada Lynx (*L. canadensis*), though not observed by the expedition, is known to occur at least as far south as Fort Tejon, Cal., where specimens were taken by Mr. J. Xantus, and sent to the National Museum. Like the Wolverine, this species ranges in the Rocky Mountains considerably south of the latitude it reaches in the eastern portion of the continent.

LYNX RUFUS, (Gm.) Raf.

Bay Lynx; Wild Cat.

Bay Cat, PENN., Syn., 1771, 183, pl. xix, fig. 1.—*Id.*, Hist. Quad., 1781, No. 171.—*Id.*, Arct. Zoöl., 1784, vol. i, 51.

Mountain Cat, PENN., Hist. Quad., 1781, No. 168.—*Id.*, Arct. Zool., 1784, vol. i, p. 51.

Bay Lynx, PENN., Hist. Quad., 1793, 303, sp. 204.

- Felis ruffa*, GULDENSTAEDT, Nov. Comm. Petrop., xx, 1776, 499.
- Felis rufa*, GMEL., Syst. Nat., 1788, vol. i, pt. i, 82, sp. 19.—SCHREB., Säugth., 1788, th. iii, 412, tab. cix B.—DESM., Nouv. Dict. d'Hist. Nat., 1816, 107.—F. CUV., Hist. Nat. Mamm., 1828, vol. ii, pl. 141.—BLAIN., Osteog., 1839-64, vol. ii, pl. xi.—DESM., Mamm., 1820, 225, No. 347.—GULDENST., Voy. de la Venus, t. 9, fig. 2-4 (skull).—TEMME, Mon. Mamm., 1827, vol. i, 141.—LESS., Man. Mamm., 1827, 192, sp. 514.—*Id.*, Compl. Buff., 1839, vol. i, 411.—GEOFF. ST. HIL., Voy. Venus, Zoöl., 1855, vol. i, 150, pl. ix.—FISCH., Syn. Mamm., 1829, 212, sp. 32.—LESS., Nouv. Tab. Règn. Anim., 1842, 57, sp. 549.—GERV., Hist. Nat. Mamm., 1855, 91.—BLYTH., Journ. Asiat. Soc. Beng., 1842, vol. xi, pt. ii, 752.
- Lynx floridana*, RAF., Amer. Month. Mag., 1817, vol. ii, 46.
- Lyncus rufus*, GRAY, P. Z. S., 1867, 279.—*Id.*, Cat. Carn. Mamm., 1869, 38, sp. 7.—DEKAY, N. H. N. Y., 1842, 7.
- Felis montana*, DESM., Mam., 1820, 225, No. 349, pl. 98, fig. 2.—LESS., Man. Mam., 1827, 194, sp. 522.—*Id.*, Compl. Buff., 1839, vol. i, 411.—HARL., Faun. Amer., 1825, 101.—LECONTE., P. A. N. S. Philada., 1854, 9.—GERV., Hist. Nat. Mamm., 1855, 92.
- Felis maculata*, VIG. & HORSEF., Zoöl. Journ., 1829, vol. iv, 380.—LESS., Comp. Buff., 1839, vol. i, 411.—*Id.*, Nouv. Tab. Règn. Anim., 1842, 58, sp. 553.
- Lynx rufus* var. *maculatus*, BAIRD, U. S. & Mex. B. Sur., 1859, 13.—*Id.*, U. S. P. R. R. Expl. Ex., 1857, vol. viii, 93.—AUD. & BACH., Quad. N. Am., 1851, vol. ii, 293, pl. xcii.
- Lynx maculatus*, MURR., Geog. Distr. Mam., 1864, 101.
- Lynx montanus*, RAFF., Am. Month. Mag., 1817, vol. ii, 46.
- Lyncus maculatus*, GRAY, P. Z. S., 1867, 297.—*Id.*, Cat. Carn. Mam., 1869, 38, sp. 8.
- Lynx rufus*, RAFF., Am. Month. Mag., 1817, vol. ii, 46.—AUD. & BACH., Quad. N. Am., 1849, vol. i, 2, pl. i.—MARCY, Expl. Red River, 1852, 200.—NEWB., P. R. R. Rep., vi, 1857, 36.—BD., Mam. N. A., 1857, 90.—COUES, Am. Nat., i, 1867, 287.—ALL., Bull. M. C. Z., ii, 1871, 168.
- Chat à ventre tacheté*, F. CUV., Hist. des Mamm., 1826, vol. ii, pl. 140.—*Id.*, Temm. Mon. Mam., 1827, vol. i, app. 258.
- Felis fasciata*, HARL., Fn. Am., 1825, 100.—SWAINS. & RICH., Faun. Bor.-Am., 1829, Mamm., 104.—MURR., Geog. Distr. Mam., 1866, 101.—CUV., Ossem. Foss., vol. iv, 441.—BUFF., Suppl., vol. iii, pl. 44.—LESS., Man. Mam., 1827, 193, sp. 521.—COOP. & SUCK., Nat. Hist. Wash. Ter., 1859, 109.—LESS., Comp. Buff., 1839, vol. i, 411.—FISCH., Syn. Mam., 1829, 212.—LESS., Nouv. Tab. Règne Anim., 1842, 57, sp. 550.
- Felis floridana*, DESM., Mam., 1820, 225, 350.—LESS., Man. Mam., 1827, 194, sp. 523.—*Id.*, Comp. Buff., 1839, vol. i, 412.
- Felis aurea*, DESM., Mam., 225, sp. 351.—LESS., Man. Mam., 1827, 194, sp. 524.—*Id.*, Nouv. Tab. Règn. Anim., 1842, 57, sp. 357.
- Felis mexicana*, DESM., Mam., 225, sp. 352.—LESS., Man. Mam., 1827, 194, sp. 525.—*Id.*, Comp. Buff., 1839, vol. i, 411.
- Lyncus fasciatus*, GRAY, P. Z. S., 1867, 276.—*Id.*, Cat. Carn. Mam., 1869, 38, sp. 6.
- Felis carolinensis*, DESM., Mam., 231.—LESS., Man. Mam., 1827, 195, sp. 527.—*Id.*, Comp. Buff., 1839, vol. i, 415.

Lynx aureus, RAF., Am. Month. Mag., 1817, 46, sp. 6.—LESS., Comp. Buff., 1839, vol. i, 412.

Panthera concolor maculata, FITZ., Sitzg. Akad. Wiss. Wien, 1869, lix, 636.

Lynx fasciatus, RAF., Am. Month. Mag., 1817, vol. ii, 46.—BAIRD, U. S. P. R. R. Expl. Exp., 1857, vol. viii, 96.—SUCKL., U. S. P. R. R. Expl. Exp., 1860, vol. xii, 109.—DESM., Mamm., 1820, vol. i, 225.

Tiger Cat, LEWIS & CLARK, Travels, 1814, vol. ii, 167.

NOTE.—The above synonymy, as prepared by Mr. D. G. Elliot, includes the three subspecies into which the present is divisible, and which, we think, will demand recognition by varietal name, since they are differentiated strictly according to geographical distribution; var. *fasciatus* being the heavily-colored red form from the wet northwest coast, and var. *maculatus* being the richly-spotted southern form.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
15	<i>L. rufus</i>	Acoma, N. Mex.	Nov., 1873	Lieutenant Russell..	Cranium and skin.
15 A	.....do	——, N. Mex.	Oct., 1873	H. W. Henshaw....	Skin.
15 B	<i>L. rufus</i> , var. <i>maculatus</i> .	White Mts., Ariz	Aug., 1873	Dr. C. G. Newberry.	Skin.

The presence of this widely-distributed animal in all suitable localities in the region explored was ascertained by the survey; and several fine specimens were secured, apparently representing both the ordinary *rufus* and the var. *maculatus*. In addition to the specimens above tabulated, others were taken in 1871, near Bill Williams' Mountain.

FAM. CANIDÆ.

Genus CANIS, L.

CANIS LUPUS OCCIDENTALIS.

American Wolf; Timber or Buffalo Wolf; Lobo of the Mexicans.

Generally distributed; but said to be scarce in Colorado, New Mexico, and Arizona. Very numerous north of the fortieth parallel, in mountains of Western Utah. Species represented by a cranium and skin, deposited in the Army Medical Museum, from Indian Spring, Utah.

CHAR.—Largest species of the genus. Length 3 to 5 feet, generally about 4; tail 12 to 18 inches; skull 8 to 11 inches long, generally 9 to 10; width $4\frac{1}{4}$ to $5\frac{1}{4}$, generally about $5\frac{1}{4}$; color indeterminate.

- a. White Wolves.*—LEWIS & CLARK, i, 107; iii, 263; FRANKLIN's Journ., 312.—*Canis lupus, albus*, SABINE, Journ., 652; RICH., F. B. A., i, 1829, 68; A. & B. ii, 156, pl. 72. White, pure or washed with yellowish, with or without black-tipped tail. Among the largest. Northerly and alpine.
- b. Grizzled Wolves.*—*C. variabilis*, MAXIM., Reise Nord-Am., 1841, ii, 95.—*C. griseo-albus*, BAIRD, 104.—*C. occidentalis* var. *griseo-albus*, NEWB., P. R. R. Rep., vi, 1857, 37; SUCKL. & GIBBS, P. R. R. Rep., xii, 1859, pt. ii, 110; SUCKL., *ibid.*, 90; COUES, Am. Nat., i, 1867, 288.—*C. occidentalis*, COOP., P. R. R. Rep., xii, pt. ii, 1859, 75 (includes *a* and *c*). White, more or less extensively grizzled with gray. Large, and rather northerly. An indeterminate link between *a* and—
- c. Gray and Brindled Wolves.*—*C. lupus* of AUTHORS; LEWIS & CLARK, i, 206, 283; SABINE, 654; ALLEN, Bull. M. C. Z., ii, 1871, p. 168.—*C. lupus, a. griseus*, RICH., F. B. A., 1829, i, 66; A. & B., iii, 279.—*C. occidentalis*, DEKAY, Nat. Hist. N. Y., 42, pl. 27, f. 2.—*Lupus occidentalis*, PEALE, U. S. Ex. Ex., 1848, 26; MARCY, Expl. Red River, 1852, 200.—*Lupus gigas*, TOWNS., Proc. Phila. Acad. Nat. Sci., 1850, ii, 75. Gray, of variable shade and pattern, generally brindled; darker along the dorsal aspect, paler or white below; little or no rufous. Medium size. Most general distribution.
- d. Red Wolves.*—*C. lupus* var. *rufus*, A. & B., ii, 240, pl. 82.—*C. occidentalis* var. *rufus*, BD., 113. Mixed reddish and black, paler below. Small. Southerly, especially Texas.
- e. Dusky Wolves.*—*C. nubilus*, SAY, Long's Exped., 1823, i, 168; GODM., Am. Nat. Hist., 1831, vol. i, 265; WOODH., Sitgr. Rep., 1854, 45.—*C. mexicanus*, Gm. S. N., 1788, i, 71.—*C. occidentalis*, vars. *nubilus* and *mexicanus*, BD., 111, 113.—? *C. nigrirostris*. Dusky or plumbeous brown, with or without darker muzzle-band and leg-stripe. Small. Chiefly southerly.
- f. Black Wolves.*—*C. lupus ater*, RICH., F. B. A., 1829, i, 70; A. & B., ii, 126, pl. 67.—*C. occidentalis* var. *ater*, BD., 113.—*C. lycaon*, HARLAN, Fn. Am., 1825, 126. Black or nearly so. Small. Chiefly southerly, especially Florida.

CANIS LATRANS, Say.

Prairie Wolf; Coyoté.

- Canis latrans*, SAY, in Long's Exped. R. Mts., i, 1823, 168.—HARLAN, Fn. Am., 1825, 83.—FISCHER, Synopsis, 1829, 183.—RICH., F. B. A., i, 1829, 731, pl. iv.—DOUGHTY's Cab. Nat. Hist., i, 1830, 73, pl. 7.—MAXIM., Reise, ii, 1841, 96.—AUD. & BACH., Q. N. A., ii, 1851, 150, pl. 71.—BD., M. N. A., 1857, 113.—COUES, Am. Nat., i, 1867, 289; 1873, 385.
- Canis frustror*, WOODHOUSE, Proc. Acad. Nat. Sci. Phila., v, Oct., 1850, 147; v, Feb., 1851, 157; Sitgreave's Exped. to Zuñi and Colorado R., 1853, 46, pl. i.
- Canis ochropus*, ESCHSCH., Zoöl. Atl., 1829, i, pl. 11.—GRAY, Zoöl. Voy. Sulphur, 1844, 32, pl. 10.
- "*Lyciscus cajottis*, H. SMITH, Nat. Lib., iv, 164."
- Prairie Wolf and Burrowing Dog*, LEWIS & CLARK.
- Coyoté*, MEXICANS & FRONTIERSMEN.

Very common from Fort Riley, Kansas, to the Pacific Ocean, and from the Upper Missouri to the Rio Grande of Texas. A number of individuals were secured from different localities visited by the expedition.

The following account is taken from Dr. Coues' different papers in the *American Naturalist*, as above cited.

"The Prairie or Barking Wolf (*Canis latrans*, Say) is by far the most abundant carnivorous animal in Arizona, as it is also in almost every part of the West. Practically, the Coyoté is a nuisance; theoretically, he compels a certain degree of admiration, viewing his irrepressible positivity of character and his versatile nature. If his genius has nothing essentially noble or lofty about it, it is undeniable that few animals possess so many and so various attributes, or act them out with such dogged perseverance. Ever on the alert, and keenly alive to a sense of danger, he yet exhibits the coolest effrontery when his path crosses ours. The main object of his life seems to be the satisfying of a hunger which is always craving; and to this aim all his cunning, impudence, and audacity are mainly directed.

"Much has been written concerning the famous polyglot serenades of the Coyoté, by those who have been unwilling listeners, but it is difficult to convey an adequate idea in words of the noisy confusion. One must have spent an hour or two vainly trying to sleep before he is in a condition to appreciate the full force of the annoyance. It is a singular fact that the howling of two or three wolves gives an impression that a score are engaged, so many, so long drawn are the notes, and so uninterruptedly are they continued by one individual after another. A short, sharp bark is sounded, followed by several more in quick succession, the time growing faster and the pitch higher, till they run together into a long-drawn lugubrious howl in the highest possible key. The same strain is taken up again and again by different members of the pack, while from a greater distance the deep melancholy baying of the more wary Lobo breaks in, to add to the discord, till the very leaves of the trees seem quivering to the inharmonious sounds. It is not true, as asserted by some, that the Coyotés howl only just after dark and at daylight. Though they may be noisiest at these times, when the pack is gathering together for a night's foraging, or dispersing again to their diurnal retreats, I know that they give tongue at any time

during the night. They are rarely, if ever, heard in the daytime, though frequently to be seen, at least in secluded regions. Ordinarily, however, they spend the day in quiet out-of-the-way places, among rocks, in thick copses, etc., and seek their prey mainly by night, collecting for this purpose into packs, as already noticed.

"The Coyoté, although a carnivore, is a very indiscriminate feeder, and nothing seems to come amiss which is capable of being chewed and swallowed. From the nature of the region it inhabits, it is often hard-pressed for food, particularly in the winter season. Besides such live game as it can surprise and kill, or overpower by persevering pursuit and force of numbers, it feeds greedily upon all sorts of dead animal matter. To procure this, it resorts in great numbers to the vicinity of settlements, where offal is sure to be found, and surrounds the hunter's camp at night. It is well known to follow for days in the trail of a traveling-party, and each morning, just after camp is broken, it rushes in to claim whatever eatable refuse may have been left behind. But it cannot always find a sufficiency of animal food, and is thus made frugivorous and herbivorous. Particularly in the fall, it feeds extensively upon "tunas," which are the juicy, soft, scarlet fruit of various species of Prickly Pear (*Opuntia*); and in the winter upon berries of various sorts, particularly those of the Juniper (*Juniperus pachyderma*), and others.

"Coyotés are so annoying that a variety of means are used to destroy them. They may be shot, of course, but to hunt them in the daytime is uncertain, and hardly worth the trouble, while night shooting is still more laborious and unsatisfactory. Their cunning, inquiring disposition is ordinarily more than a match for man's ingenuity in the way of traps. The most certain as well as the easiest method of obtaining them is by poisoning the carcass of a dead animal or butcher's offal with strychnine. There is no doubt, also, that the odor of assafoetida is attractive to them, and a little of this drug rubbed into the poisoned meat greatly heightens the chances of their eating it. Since, after eating the poison, they suffer greatly from thirst, it is well to place a tub of water conveniently at hand, which generally keeps them from making off for water, and so being lost. There is considerable difference in the fur, both as to quality and color, according to

the season. In the winter, it is fuller, thicker, and softer than in summer, and has much less tawny or rufous about it, being almost entirely black and grizzled grayish white.

“Except under certain circumstances, there is a chronic feud between our domestic dogs and these dog-wolves. A good-sized dog will easily whip a Coyoté, though he may not come off unscathed from the sharp teeth and quick snaps of the latter. I have known a smallish terrier even to kill a Coyoté, of which he caught a throat-hold, enabling him by vigorous shakes to beat in the wolf's skull against some bowlders between which the conflict took place. Notwithstanding, there is abundant evidence that the Coyoté will cross and bear fertile offspring with the domestic dog; and I believe the female of either will take the male of the other. During the season of heat, which is in spring, I have known dogs to disappear for several days, and return in such a dilapidated condition as to leave no doubt they had been decoyed away by some female Coyoté, and received hard treatment from her or her relatives. The hybrid is said to possess the bad qualities of both parents, and the good ones of neither, as usual with bastards, and to always remain snappish and intractable, spite of severity or kindness. The gestation of the species, as is well known, does not differ materially from that of its allies. It brings forth in May or in June, in secluded places, usually under or among rocks. Five or six puppies are ordinarily produced at a birth.

“A variety of absurd stories regarding its reproduction pass current among even the best-informed backwoodsmen; many affirming that the pups are born shapeless, inchoate masses, to be afterward licked into proper shape by the mother.”—(Am. Nat. i, 1867, 289, *et seq.*)

“A large amount of fresh material, gathered on the Upper Missouri, may furnish some data bearing upon the question, now agitated, of the resemblance of the Coyoté to the dog of the Bronze Period. The examination is made of about twenty skins with skulls, and several specimens in the flesh. I compare them with a dog very nearly of the same size, selecting for this purpose a thorough-bred pointer—an animal which, in its enlarged brain-box, shortened muzzle, pendulous lips, long, loose, silky, drooping

ears, close, glossy coat and rat-like tail, departs as much, perhaps, as any breed, from an original stock, in all the fortuitous points engrafted through domestication. Even in this case, the likeness in all essential respects is striking, and, as shown in the sequel, specimens of Indian dogs of this region can be found not certainly distinguishable from a Coyoté, for a reason that will be evident. The differences between the Coyoté and pointer become reduced to character of pelage and physiognomy; while the facial aspect itself, so strikingly diverse in its entirety, appears, when analyzed, much less substantially different.

“To begin with size and proportions: it appears from the following measurements that the pointer and Coyoté differ less in these respects than the normal individual variation among Coyotés themselves; and that there is no essential discrepancy whatever in general ‘build.’

Comparative measurements of a medium-sized male pointer and several Coyotés of both sexes.

[The measurements are given in inches and decimals.]

Measurements.	Pointer ♂ dog.	Large ♂ Coyoté.	Medium ♂ Coyoté.	Large ♀ Coyoté.	Small ♀ Coyoté.
Standing height at shoulder.....	24	24	21	22	19
Tip of nose to root of tail	36	36	33	34	28
Tail to end of vertebræ	13	14	12	14	11
Tail to end of hairs.....	14	18	15	16.50	13.50
Tip of nose to eye.....	4	4	3.75	4	3.50
Tip of nose to ear	8	.....	7.50	7.75	7
Tip of nose to occiput	9	8.50	8.25	8.50	7.50
Elbow to end of fore claws.....	14	13.25	12	12.50	11.50
Knee to end of hind claws.....	16	16.25	13.50	.....	.....
Heel to end of hind claws.....	8	7.25	6.75	7	6.50
Width across eyes at inner canthus.....	2.50	.....	1.60	.....	.....
Width across eyes at outer canthus.....	4.25	.....	3.25	.....	.....
Width across inner base of ears.....	4.65	.....	4	.....	.....
Height of ear above notch.....	5	.....	4	.....	.....
Width across tips of outstretched ears.....	15	.....	11.75	.....	.....
Greatest width of ear, pressed flat.....	3.25	.....	3.25	.....	.....
Tight girth of muzzle at middle	8.50	.....	7.50	.....	.....
Tight girth of chest.....	26	.....	19	.....	.....
Tight girth of belly.....	23	.....	16.50	.....	.....
Longest hairs of back	1.50	.....	5	.....	.....
Width across hairs of tail, pressed flat .....	.....	.....	8.50	.....	.....

“The Coyoté appears more stoutly built, but this is deceptive, owing to the dense furring; the various girths show the contrary. It is, however, somewhat more ‘compact’, the limbs lacking a certain freedom of swing, if not being slightly shorter.

“It would not be much to the point to compare the pelages, since the cultivated coat of the pointer differs quite as much from the shaggy one of numerous other dogs as from that of the Coyoté. It is interesting to observe, however, that even the closest-haired pointer shows in anger a slight though decided ‘mane’. The mane of the Coyoté is very conspicuous; the longest hairs over the back measuring four to six inches. The furring of the tail is as extremely diverse. The tail of a Coyoté ordinarily droops to the suffrago; the hairs reaching beyond half-way to the heels. It is perfectly straight. The ‘brush’ is terete-tapering, perhaps not quite so full for its length as that of a fox; in absolute size, it is just intermediate between that of a *Vulpes velox* and *V. macrurus*, both of which are smaller animals. But, furring aside, we find, in the total lack of curve in the thorough-bred pointer’s tail, a curious coincidence, if nothing more. This straightness, prized by sportsmen, the result of breeding, and often cruelly insured by removal of the terminal joints, so that some of the tendons lose insertion, is a feature in which the pointer departs from most dogs (the curly tail has been laid down as a specific characteristic of ‘*Canis familiaris*’), and resumes that of the Coyoté.

“Fortuitous conditions of pelage aside, the physiognomy, an almost equally casual matter, is the most striking difference between the two. It is difficult to portray an animal’s facial expression in words; in this case, we can hardly do better than to say that the aspect is just between a wolf’s and a fox’s, but more ‘doggy’ than either. Audubon’s figure is good; if anything, the front view of the upper figure is too ‘foxy’. The Coyoté’s face would be exactly matched by that of many cur-dogs, especially slender-nosed kinds, did it not lack almost entirely the frontal prominence of the latter; a feature which, in some kinds of lap-dogs, is exaggerated into monstrosity.

“The upper profile of the Coyoté’s face, from occiput to snout, deviates not much from a straight line; the forehead being remarkably flat. This

feature gives an appearance of breadth that is deceptive; the real width being both absolutely and relatively less than in the pointer. But the width across the ears of the pointer (six inches instead of four) is largely produced by the drooping of these organs down the side of the head. The lips are thin and scant, ordinarily showing the teeth, always parting after the animal is dead. There is something peculiar about the eyes; they seem to look more directly forward than those of the pointer. They are set very near together, the inner angles being only about an inch and a half apart; yet the obliquity carries the outer canthi over three inches apart. The ears are very large, triangular, pointed, upright, with very stiff cartilage. When pressed apart, their tips form with the point of the snout a nearly equilateral triangle. In fine, the pointer's physiognomy differs from the Coyoté's mainly in its special engrafted features, and these produce a discrepancy much greater than that existing between the Coyoté and many mongrel dogs.

"It is unnecessary to compare the skulls of the animals. There are no differences of moment, at least viewing the immense discrepancies existing in the crania of different breeds of dogs. Nor does an 'average' dog's skull differ from a Coyoté's by anything like as much as do the skulls of *C. latrans* and *C. lupus*.

"It appears, then, that the pointer, though a highly-specialized case of the domestic dog, is identical in essential structural points with the Coyoté; differs less in size than Coyotés vary among themselves; differs no more in pelage than it does from many other dogs; and, in details of form and physiognomy, differs vastly less than various dogs do among themselves. It appears, furthermore, that close as the likeness is, it is less than that subsisting between the Coyoté and various kinds of dogs domesticated by the Indians.

"For example, there is nothing in Audubon's description of the Hare-Indian dog specifically inapplicable to the Coyoté. Even the colors are the same; the difference in pattern (masses of blackish instead of brindling) is not of the least consequence, since it is entirely unstable. Richardson noted close traits of resemblance, even to the remarkable mode of outcry—a few short, sharp barks, followed by a prolonged, shrill howl. The fact that this particular strain of dog is bred beyond the present distribution of the Coyoté is, of course, not to the point in the general question. But we have much

more striking and unquestionable evidence of relationship by direct descent of some Indian dogs from the Coyoté. In the first place, we should note that the habitual antagonism of these dogs and the Coyotés is nothing but the animosity all dogs show to strangers of their own kind, an aversion probably rooted in jealousy, which is a strong canine trait. Next, we continually find dogs of both sexes on the frontier deserting their haunts at particular (sexual) periods; and if the occurrence of a feral wolf-dog (Coyoté ♀ and dog ♂) has not been recorded, there are numerous cases of the production of the same (from Coyoté ♂ and dog ♀) in domestication. I have, finally, information which I consider perfectly satisfactory, in still stronger evidence of the readiness with which the two animals interbreed.

“Indians not unfrequently bring it about themselves; on suitable occasions, they picket out their ♀ dogs over night to procure the cross, with constant success. What profitable quality is secured, I do not know; but such is the case.

“These crosses are not known to be otherwise than fertile; and the result is, in every Indian community there are mongrel dogs shading into Coyotés in every degree; all having the clear wolf-strain, and some being scarcely distinguishable from a prairie-wolf.

“The matter of color merits passing mention. The Coyoté is as constant in this respect as other *Feræ*, and I think its peculiar coloring can be reasonably traced in certain dogs. The animal is dingy white as a ground-color, which remains so on all the under parts; above, it is suffused with tawny brown (bright in summer, paler and more grayish, or quite gray, in winter). This color is overlaid with a clouding of black. This black is rarely uniformly distributed; it tends to streakiness along the back and across the shoulders and hips, producing a pattern similar to that of a “brindled” bull-dog. But there is a more striking feature, and one very characteristic of the animal (the brindled gray and black being shared exactly by an ordinary strain of *C. lupus*). The top of the muzzle, back of the ears, and outside of both fore and hind legs are usually nearly uniformly tawny. This shade is precisely the so-called “tan” of the black-and-tan terrier, and has the same general distribution. In an attempt to trace pedigree, a fact of this sort seems to rank in value with the appearance, in a horse or mule, of the stripes of a quagga-stock.”—(*Am. Nat.*, 1873, 385.)

Genus VULPES.

VULPES VULGARIS PENNSYLVANICUS, (Bodd.) Coes.

American Red Fox.

Brant Fox, PENN., Hist. Quad., 235; Aret. Zool., 1784, 47.

Renard de Virginie, PAL. DE BEAUV., Bull. Soc. Philom.

Canis vulpes var. *pennsylvanicus*, BODD., Elenchus Anim., 1784, 96 (from Pennant).

Canis fulvus, DESM., Mamm., i, 1820, 203 (from Pal. de Beauv).—FR. CUV., Diet. Sci. Nat., viii, 568.—HARLAN, Fn. Amer., 1825, 89.—GRIFFITH, An. Kingd., v, 1827, 150.—DOUGHTY'S Cab. N. H., i, 1830, 25, pl. 3.—GODMAN, Am. Nat. Hist., i, 1831, 286.

Vulpes fulvus, RICH., Fn. Bor.-Am., i, 1829, 91.—FISCHER, Syn., 1829, 191.—DEKAY, N. Y. Fn., i, 1842, 44, pl. 7, f. 1.—AUD. & BACH., Quad. N. A., ii, 1851, 263, pl. 87.—BAIRD, Mamm. N. A., 1857, 123.

Canis (*Vulpes*) *vulgaris* var. *fulvus*, WAGN., Suppl. Schreber, ii, 1841, 413.

Red Fox, *Common Fox*, ANGLICÆ.

CHARS. of the ordinary variety (*pennsylvanicus*).—Pelage long, fine, and lustrous; brush large and full, the distance between the ends of the outstretched hairs 6–7 inches. Ears haired both sides; feet so clothed that the claws and balls are nearly hidden. Tail to end of hairs rather more than half as long as the head and body. General color bright brownish-red or tawny red, rather darker on the shoulders and flanks, blackening on the back of the ears and outsides of the legs below, and on the ends of the tail-hairs; space around the black snout, edges of upper jaw, chin, throat, breast, and narrow belly-line more or less purely white; tip of tail usually white.

Coloration subject, as in many other animals, to melanism in varying degree from the slightest darkening of normal shades to black; one particular stage of incomplete melanism being strongly marked and frequent. These melanotic conditions have their due interest as items of natural history, and great commercial importance, but no classificatory significance whatever. A special state of semi-melanism is—

The *Cross-Fox* (*decussatus*).—Muzzle, legs, and middle line of under parts blackish, with two cross-bars running down the inside of the legs. A more or less extended dark dorsal band crossed by another over the shoulders. Tail largely obscured by the increased black ends of the hairs; the white tip often wanting. Forehead and back dark grayish, owing to grizzled appearance of the plumbeous-black roots of the hairs, with their pale

tips. Sides of the head and neck, and of the body itself, a varying shade of ferrugineous or reddish-yellow; inner surface of ears the same. Black of under parts frequently ending on the chest, when the rest and the parts about the root of the tail below are pale rusty. Shades into the preceding and following styles by insensible degrees. This is *Canis* or *Vulpes fulvus* var. *decussatus*, of AUTHORS; RICH., Fn. B.-A., i, 1829, 93; AUD. & BACH., i, 1849, 45, pl. 6; BD., 124.

Melanism complete or very nearly so results in—

The BLACK or SILVER-GRAY FOX (*argentatus*).—Black; tail usually conspicuously white-tipped; more or fewer of the hairs, especially of the back and flanks, tipped with white or gray, producing a “silvered” appearance. Perfectly black animals are extremely rare and correspondingly high-priced. This style of pelage is chiefly produced in high latitudes. *C.* or *V. argentatus*, or *fulvus* var. *argentatus*, of AUTHORS; RICH., Fn. B.-A., 1829, i, 94; AUD. & BACH., iii, 1853, 70, pl. 116; BD., 124.

Lieut. W. L. Marshall reports having seen a fox which he supposed to be of this variety in New Mexico. If his identification is correct, this fact would extend the limit of the animal very far to the southward of its ordinary range.

Dimensions of any of the varieties.—Nose to root of tail, 2-2½ feet; tail to end of bones, 12-15 inches; to end of hairs, 15-19 inches. Ear, 2½-2¾ inches high, Height at shoulders rather over 1 foot. Skull about 5½ inches long by 3 inches in greatest width.

While the Cross and Black or Silver Foxes are usually considered as different “varieties”, they are not such, in the classificatory sense of that term, any more than are the red, black, or white wolves, the black marmots, squirrels, etc. The proof of this is in the fact that one or both of the “varieties” occur in the same litter of whelps from normally-colored parents. They have no special geographical distribution, although, on the whole, both kinds are rather northerly than otherwise, the Silver Fox especially so. It does not appear to be ascertained exactly how far the styles of pelage tend to perpetuate themselves, that is to say, in what proportion of cases a cross will produce a cross litter, or a black a black litter; but the interbreeding of the several varieties, and their purely accidental origin from parents of the normal coloration, are incontestable.

There is likewise no reasonable question of the specific identity of the American and European Red Fox, in which latter the same color-variations occur. Indeed, it has been surmised, apparently not without some foundation, that the American are lineal descendants of imported European individuals, and this hypothesis is more strongly colored from the fact of the abundance of the animal in settled districts. It is difficult, however, to suppose that an animal could have become in such short time so universally spread over a continent; a more reasonable hypothesis ascribing to it an original circumpolar distribution in warmer times gone by, whence it has spread southward in either hemisphere. This, it will be observed, by no means excludes the supposition that many of the animals may have also sprung from direct importation. Subjected for a long period to different climatic conditions, it is no wonder that the American has repeatedly been considered as a distinct species, on the grounds of certain slight observable differences. It offers a case parallel with many others we shall have to notice in this volume. According to Audubon, whose opportunities for comparison were ample, the American Red Fox "is a little the largest; its legs are less robust; its nose is shorter and more pointed; the eyes are nearer together; its feet and toes more thickly clothed with fur; its ears shorter; it has a finer and larger brush; and its fur is much softer, finer, and of a brighter color." These differences, it will be observed, are all comparative, not positive; and, although undoubtedly subsisting on the average, are liable to be nullified by the first specimens one may happen to compare. It is going quite far enough to admit a geographical distinction of race.

The generic structural discrepancies, the dissimilarity in color, and a difference in build, easier to remark upon comparison than to express in words, readily distinguish the Red Fox, in any of its pelages, from the Gray Fox (*Urocyon virginianus*).

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
415	<i>Vulpes vulgaris pennsylvanicus</i>	Los Pinos, Colo.	Aug, 1874	Dr. H.C. Yarrow.	Skin.

VULPES MACRURUS, Bd.

Large Prairie Fox.

Vulpes macrourus, Bd., Stansbury's Rep. Expl. Great Salt Lake, 1853 (pub. June, 1852), 309.—*Id.*, Mamm. N. A., 1857, 130.—HAYDEN, Trans. Am. Phil. Soc., xii, 1862, 142.

Vulpes utah, AUD. & BACH., Proc. Philada. Acad., July, 1852, 114.—*Id.*, Quad. N. Am., iii, 255, pl. 151.—COUES, Am. Nat., i, 1867, 292.

? *Vulpus fulvus*, MAXIM., Reise, 1841, ii, 98.

Large Red Fox of the Plains, LEWIS & CLARK, ii, 168.

CHARS.—Averaging larger than the Red Fox. Tail very long, extremely bushy; fur long, fine, and thick; coloration substantially as in the Red Fox, and presenting the same special degrees of melanism (cross, silver-gray, and black), but the normal coloration "yellow" rather than "red." Skull, $5\frac{3}{4}$ by $2\frac{3}{4}$, thus longer and narrower than in the Red Fox. Nose to root of tail, 30–33 inches; tail to end of vertebræ, 16; to end of hairs, 21; greatest breadth across flattened hairs at the end, 10 inches, elsewhere about 8. Nose to eye, $3\frac{1}{2}$; to ear, $5\frac{1}{2}$; to occiput, $6\frac{1}{2}$; ear, $3\frac{1}{2}$ high posteriorly; elbow to wrist, 6; to end of toes, 10; knee to ankle, 6; heel to end of toes, 6.

We indorse the specific character of this animal with some misgiving. As Professor Baird himself says: "Owing to the close resemblance to the common Red Fox, it is difficult to describe the Prairie Fox intelligibly except by comparison with the other species." There are, however, certain tangible differences, not accounted for upon any of the recognized laws of variation among animals of the region this supposed species inhabits; and it is, moreover, associated in some parts of its habitat with the common species. These two considerations have weighed with us in making a decision, provisionally, of specific rank.

A single specimen, believed to be of this species, was closely observed at Deep Creek, Utah. It is thought to be tolerably common in Utah and Nevada, as Indians were seen with skins in their possession.

A specimen, which we are inclined to refer to this species on account of its great size and especially large tail, is jet black all over, with a pure white tip to the tail; one of the finest examples of complete melanism we have seen. The purity of the black is only interrupted by a slight gray grizzle on the face and rump. It was collected in Colorado.

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
392	<i>Vulpes macrurus</i> ? (melanotic)	Los Pinos, Colo.	Sept., 1874	Dr. H. C. Yarrow	Skin.

Genus **UROCYON**, Baird.**UROCYON CINEREO-ARGENTATUS**, (Schreb.) Cones.**Gray Fox.**

- Gray Fox*, CATESB., Car., ii, 1731, 78, pl. 78.—PENN., Syn. Quad., 1776, 157.—*Id.*, Hist. Quad., 1781, No. 160.—*Id.*, Aret. Zoöl., i, 1784, 48.
- Canis cinereo-argentatus*, SCHREBER, Säug., iii, 1778, 360, pl. 92 (has actual priority over Erxleben).—ERXL., Syst. An., 1777, 576.—GM., Syst. Nat., i, 1788, 74.—SHAW, Gen. Zoöl., i, 1800, 324.—DESM., Mamm., i, 1820, 204 (*partim*).—HARLAN, Fn. Amer., 1825, 90.—GRIFF., An. Kingd., v, 1827, 148.—GODMAN, Am. Nat. Hist., i, 1831, 280.—FR. CUV., Suppl. Buff., i, 1831, 187.—DOUGHTY'S Cab. Nat. Hist., ii, 1832, 145, pl. 14.—WAGN., Suppl. Schreber, ii, 1841, 436 (partly).—WOODH., Sitgreave's Rep. Expl. Zuñi and Colorado, 1854, 46.
- Canis virginianus*, SCHREB., Säug., iii, 1778, 361, pl. 92.—ERXL., Syst. An., 1777, 567.—GM., Syst. Nat., i, 1788, 74.—SHAW, Gen. Zoöl., i, 1800, 325.—HARLAN, Fn. Amer., 1825, 89.—GRIFF., Anim. Kingd., v, 1827, 150.—RICH., F. Bor.-Amer., i, 1829, 96 (*Vulpes*).
- Vulpes virginianus*, DEKAY, N. Y. Fn., i, 1842, 45, pl. 7, f. 2.—AUD. & BACH., Quad. N. A., i, 1849, 162, pl. 21.
- Vulpes (Urocyon) virginianus*, BD., Mamm. N. A., 1857, 138.
- Canis griseus*, BODD., Elench. Anim., i, 1784, 97 (*ex Penn.*).

The cranial characters of *Urocyon*, as compared with *Vulpes*, are very remarkable, fully warranting generic distinction, if not, indeed, of still higher taxonomic value. The differences are much greater than those subsisting between *Vulpes* and *Canis*. These were first pointed out in 1857, by Professor Baird, in the work above cited, p. 121. The principal characters are as follows; in addition to those of cranium, there is a very curious condition of pelage on the tail; in consideration of which the name of "Mane-tailed Foxes" was applied to the group, which contains, besides the present species, the *U. littoralis*.

VULPES proper.—Temporal crests approximate, nearly parallel, and single, as far as the coronal suture. No supplementary tubercle on lower sectorial tooth. Tail uniformly haired. Muzzle comparatively long. Angle of jaw ordinary, and skull, in general, thoroughly canine.

UROCYON, Baird.—Temporal crests divaricate, oblique, widely separated at coronal suture. A supplementary tubercle on lower sectorial tooth.

Tail with a hidden mane of stiff hairs along the upper line. Muzzle comparatively short. Angle of jaw peculiar, (angularly emarginate).

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
401	<i>Urocyon cinereo-argentatus</i>	Taos, N. Mex ..	Aug., 1874	Dr. H.C. Yarrow.	Skin.

DESCR.—About as large as the Red Fox, but much more stoutly built, with shorter and broader head; tail not perfectly cylindrical nor uniformly haired, having a stiffish mane along the dorsal line. Prevailing color above a gray grizzle, produced by intimate mingling of black and hoary whitish, with which each hair is annulated; it is darkest along the dorsal line, and the upper surface of the tail has a similar blackish lengthwise stripe; sides of tail hoary, under surface tawny. Sides of the neck, flanks, and more or less of the outer surfaces of the limbs rich fulvous, or cinnamon-brown; under parts tawny whitish, usually pure white on the throat. Muzzle banded with black, extending on the chin; lower half of head, tip of chin, and sides of muzzle at end white. Back of ears not black (more or less tawny); tip of tail not white (black, in continuation of the dorsal stripe). Length about 28 inches; tail, to end of vertebræ, 13 to 16 inches; to end of hairs, 14 to 18; ears, $2\frac{1}{2}$ high; hind foot, 5 inches; skull, $4\frac{1}{2}$ to $4\frac{2}{3}$ by $2\frac{1}{3}$ to $2\frac{2}{3}$.

Different specimens of the Gray Fox vary much in the shade of the grizzled gray parts, extent and intensity of the fulvous, and precise pattern of the black and white on the head; but the animal does not appear subject to the particular variations so conspicuous in the Red Fox (although partial crossing has been recorded), and is always distinguishable on sight by color, independently of the differences in build, in physiognomy, and in cranial characters.

Although both species are found together over a great part of our country, the Gray is, on the whole, a more southern animal than the Red. It is not common north of Pennsylvania and Southern New York, is rare in New England, and only casual in Maine and Canada. Along its proper parallels of latitude, it extends across the country from Atlantic to Pacific, wherever the surface is suitable; but, being rather a woodland animal, it

shuns prairie as a rule, so that there are extensive regions where it may never be seen, although occurring on either side. From Virginia southward is the characteristic species, and abundant; it occurs in Texas, California, and Oregon.

Sharing vulpine traits with its kind, the Gray Fox has, nevertheless, its peculiarities. It is not a burrowing animal, at least to any great extent; and, when it digs, the burrow is simple, with a single entrance. It lies concealed in rank herbage, beneath or inside fallen logs, under partially-excavated stumps, and similar retreats. This habit is in evident correlation with its woodland range; for having no such protection as the Red Fox, which takes to the earth anywhere, it is forced to abide where there are the natural means of concealment just mentioned. This same habit, moreover, causes a certain modification of the animal's range with the settling of a country. In clearing off forests, the Gray Fox is forced to seek elsewhere; although, in effect, the circumstances that cause removal of one species are precisely those that invite the other, the Red Fox being able to exist in settled regions where the other could find no suitable resorts. It is this that makes the Red a greater nuisance to the farmer; it sticks closer to the farm-yard, being forced in a measure to thus supply itself, owing simply to its being in more cultivated districts. The Gray Fox subsists more extensively upon the wild game of his habitat. Another distinctive trait is the climbing powers of the Gray Fox; much greater than would be expected from an animal with non-retractile claws and no great "hugging" powers. When hard-pressed, the Gray Fox is treed, as regularly as the Red is earthed. The climbing seems to be chiefly an agile leaping along an inclined trunk, or from bough to bough; though it has been noted that the animal can climb small trunks by clasping, or even with its claws, like a cat or raccoon.

According to our observations, this is to be considered the characteristic fox of Arizona, where it is much more abundant than the Red.

MUSTELIDÆ.

Subfamily MARTINÆ.

Genus PUTORIUS, Cuvier.

PUTORIUS LONGICAUDA.

Long-tailed Ermine.

? *Mustela longicauda*, BP., Charlesw. Mag., 1838, 38.—GRAY, List Mamm. Br. Mus., 195.

? *Putorius longicauda*, RICH., Zoöl. Beechey's Voy., 1839, 10 * (in text).

Putorius longicauda, BD., Mamm. N. A., 1857, 169.—SUCKLEY, P. R. R. Rep., xii, pt. ii, 1859, 93, 114.—HAYD., Tr. Amer. Phil. Soc., xii, 1862, 142.—(?) ROSS, Canad. Nat. & Geol., vi, 1861, 441.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
419	<i>Putorius longicauda</i>	Fort Garland, Colo.	June 23, 1873	Mr. Schmeiding.	Skin.
400	.....do.	Taos, N. Mex.	Aug., 1874	Dr. H.C. Yarrow.	Skin.
399	.....do. ....	.....do. ....	.....do. ....	.....do.	Skin.

The above specimens are interesting as demonstrating a more southerly range of the species than is generally recognized, and as showing some characters not exhibited by the typical form from the Missouri and Yellowstone plains.

In his monograph of this family, now about publishing, Dr. Coues has shown that the present species is distinct from *P. erminea*, to which it had usually been referred with doubt, and that, moreover, its closest relationships are with the Bridled Weasel (*P. brasiliensis*, var. *frenatus*). It shares with the last the peculiar rusty-red or salmon-colored (instead of clear sulphury, as in *P. erminea*) under parts. Now, these New Mexican skins show another decided approach to *P. frenatus* in darkening of the head; this part being as dark as it is in *P. xanthogenys*, which is merely the northernmost Pacific extension of *P. frenatus*. Were white spots present in these skins, they would unhesitatingly be referred to *P. frenatus* by any naturalist; and we know that, in undoubted specimens of the latter from Mexico and Central America, the peculiar facial markings are not seldom extinguished. The specimens are strong proof of the correctness of Dr. Coues's view that *P. longicauda* should be compared with *frenatus* and not with *erminea*.

We have no notes on the habits of this species, which, however, probably differ in no essentials from those of its better-known congeners. It appears to be a rather common animal in the regions explored.

One specimen shows, as an accidental peculiarity, a pencil of white hairs in the black tuft at the end of the tail.

PUTORIUS VISON, (Schreb.) Rich.

The Mink.

Mink, SMITH, Virginia, 1624.

Foutereau, LA HONT., Voy., i, 1703, 81.

Minx, LAWSON, Car., 1709, 121.

Vison, BUFF., Hist., xiii, 1765, 304, pl. 43.

Mustela vison, SCHREB., Säug., iii, 1778, 463, pl. 127 b.—GM., Syst. Nat., i, 1788, 94.—TURT., Syst. Nat., i, 1806, 58.—DESM., Mam., i, 1820, 183 (*Martes*).—CUV., Règne Anim., i, 1817, 150 (*Martes*).—HARL., Fn. Amer., 1825, 63.—GRIFF., An. King., v, 1827, 124.—LESS., Man., 1827, 148.—RICH., F. B.-A., i, 1829, 48 (*Putorius*).—MAXIM., Reise, i, 1839, 213.—WAGN., Suppl. Schreb., ii, 1841, 241 (*Lutreola*).—THOMPS., Vermont, 1853, 31.

Lutra vison, SHAW, Gen. Zoöl., i, 1800, 448.

Putorius vison, GAPP., Zoöl. Jour., v, 1830, 202.—DEKAY, N. Y. Zoöl., i, 1842, 37, pl. 11, f. 1, pl. 8, f. 3, a, b.—AUD. & BACH., Q. N. A., i, 1849, 250, pl. 33.—KENN., Tr. Ill. State Agric. Soc., 1853-54, 578.—BEESLEY, Geol. Cape May, 1857, 137.—BAIRD, Mamm. N. A., 1857, 177.—NEWB., P. R. R. Rep., i, 1857, 42.—COOP. & SUCK., N. H. W. T., 1860, 93, 115.—BILLINGS, Canada Nat. & Geol., ii, 1857, 48.—ROSS, Canad. Nat. & Geol., vi, 1861, 29.—MAXIM., Verz. N. A. Säug., 1862, 52.—SAM., Rep. Mass. Agric. for 1861, 1862, 157, pl. 1, f. 8.—GILPIN, Tr. N. Scotia Inst., ii, 1870, 12, 59.—AMES, Bull. Minn. Acad. Nat. Sci., 1874, 69.

Mustela lutreola, FORST., Phil. Trans., lxii, 1772, 371.

Putorius lutreolus, ALLEN, Bull. M. C. Z., i, 1869, 175.

Putorius lutreolus var. *vison*, ALLEN, Bull. Essex Inst., vi, 1874, 54, 59, 62.

Mustela lutreola, var. *americana*, SCHINZ, Syn. Mamm., i, 1844, 347.

Vison lutreola, GRAY, List Mam. Br. Mus., 1843, 64 (partly).

Mustela canadensis, ERXL., Syst. An., i, 1777, 455 (mixed with another species, but the description *clearly* is of this species).

Mustela canadensis var. *vison*, BODD., Elench. Anim., i, 1784, 86 (*ex Buff*).

Mustela weningus, BARTON, Am. Phil. Tr., vi, 1809, 70.

Mustela minx, TURTON, Syst. Nat., i, 1806, 58.

Mustela lutreocephala, HARL., Fn. Amer., 1825, 63.

Vison lutreocephala, GRAY, P. Z. S., 1865, 116.

Common throughout the Territory of Utah near the water-courses. Some very fine specimens secured at Provo. For boldness and thieving proclivities, this little animal is unequalled; and, during our collecting at

Provo, some ducks, allowed to remain in the water where they fell, in a short time were mutilated to such an extent by minks as to be useless for taxidermic purposes.

MUSTELA AMERICANA, Turton.

American Sable.

- Mustela martes*, FORST., Phil. Trans., lxii, 1772, 342; and of many American writers.
Mustela americana, TURTON, Syst. Nat., i, 1806, 60.—BD., M. N. A., 1857, 152.—NEWB., P. R. R. Rep., vi, 1857, 41.—KNEELAND, Pr. Bost. Soc., vi, 1858, 418.—COOP. & SUCKL., N. H. Wash. Terr., 1860, 92.—ROSS, Canada Nat. & Geol., vi, 1861, 25.—GILPIN, Tr. Nova Scotia Acad., ii, 1870, 10, 59.—AMES, Bull. Minn. Acad., 1874, 69.
Martes americana, GRAY, P. Z. S., 1865, 106 (with vars. *abietinoides*, *huro*, and *leucopus*).
Mustela zibellina var. *americana*, BRANDT, Beit. Säug. Russl., 1855, 16, pl. 3, f. 10.
Mustela zibellina, GODM., Am. Nat. Hist., i, 1831, 208.
Mustela vulpina, RAF., Am. Jour. Sc., i, 1819, 82.
Mustela leucopus, KUHLE, Beit., 1820, 74.
Martes leucopus, GRAY, List Mamm. Br. Mus., 1843, 63.
Mustela huro, FR. CUV., Dict. Sc. Nat., xxix, 1823, 256.
Mustela leucotis, GRIFF., An. Kingd., v, 1827, 126.
Mustela martinus, AMES, Bull. Minn. Acad., 1874, 69.

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
398	<i>Mustela americana</i>	Taos, N. Mex	Aug., 1874	Dr. H. C. Yarrow.	Skin.

Particularly interesting on account of the locality, which is the southernmost on record thus far for the species.

GULO LUSCUS, (L.) Sab.

Wolverene.

- Ursus freti-hudsonis*, BRISS., Quad., 1765, 260.
Ursus luscus, L., S. N., i, 1766, 71.
Meles luscus, BODD., Elench. Anim., i, 1784, 80.
Gulo luscus, J. SABINE, Frankl. Jour., 1823, 650.—E. SABINE, App. Parry's 1st Voy., 1824, clxxxiv.—RICH., App. Parry's 2d Voy., 1825, 292.—RICH., F. B. A., i, 1829, 41.—DEKAY, N. Y. Zoöl., i, 1842, 27.—AUD. & BACH., Quad. N. A., i, 1849, 203, pl. 26.—THOMPS., Vermont, 1853, 30.—BD., Stansbury's Rep., 1852, 311.—BD., Mamm. N. A., 1857, 181.—MAXIM., Verz. N. A. Säug., 1862, 35.—COUES, Am. Nat., i, 1867, 352.—ALLEN, Bull. M. C. Z., i, 1869, 177.
Id., Bull. Essex, Inst., vi, 1874, 54.—TRIPPE, *apud* Coues's Birds of the Northwest, 1874, 224 (in text).
Gulo arcticus var. A., DESM., Mam., i, 1820, 174.
Gulo wolverene, GRIFF., An. Kingd., v, 1827, 117.

Sparingly found in Wahsatch Mountains. One very fine skin obtained from Indians at Fillmore, Utah. Stuffed specimen seen in Salt Lake City Museum from Bear River, Utah. This is near the extreme southern limit where this animal has been found. It is only lately that the southward extension of the species in the Rocky Mountains has been fully determined. Both Mr. Allen and Mr. Trippe ascertained its occurrence in Colorado south of 40°, and Dr. Coues obtained evidence of its existence even in Arizona.

Subfamily MEPHITINAE.

Genus MEPHITIS, Cuv.

MEPHITIS MEPHITICA, (Shaw) Bd.

American Skunk.

(?) *Viverra mephitica*, SHAW, Gen. Zoöl., i, 1800, 390.

Mephitis mephitica, BD., Mamm. N. A., 1857, 195.—COOP. & SUCKL., N. H. Wash. Terr., 1860, 94.—HAYD., Trans. Amer. Phil. Soc., xii, 1861, 143.—SAM., 9th Ann. Rep. Agric. Mass., 1862, 161.—GERRARD, Cat. Bones Br. Mus., 1862, 97.—ALLEN, Bull. M. C. Z., i, 1869, 178 ; ii, 1871, 169.—ALLEN, Pr. Bost. Soc., xiii, 1869, 183.—GILP., Pr. Nova Scotia Inst., ii, 1870, 60.—STEV., U. S. Geol. Surv. Terr. 1870, 1871, 461.—PARKER, Am. Nat., v, 1871, 246 (anatomy).—ALLEN, Bull. Essex Inst., vi, 1874, 46, 54, 59, 63.—ALLEN, Proc. Bost. Soc., xvii, 1874, 38.—AMES, Bull. Minn. Acad., 1874, 69.

Mephitis chinga, TIEDEM., Zool., i, 1808, 362 (partly).—AUD. & BACH., Quad. N. A., i, 1849, 317, pl. 42.

Mephitis varians var. *chinga*, GRAY, P. Z. S., 1865, 148.

“*Mustela*” *americana* var. K, DESM., Mam., i, 1820, 186 (*lapsu* for “*Mephitis*”).

Mephitis americana, SAB., Frankl. Jour., 1823, 653.—DEKAY, N. Y. Zoöl., i, 1842, 29, pl. 12, f. 1.—WYMAN, Pr. Bost. Soc., i, 1844, 110 (anat.).—WARREN, Pr. Bost. Soc., iii, 1849, 175 (anat.).

Mephitis americana var. *hudsonica*, RICH., F. B. A., i, 1829, 55.

Chincha americana, LESS., Nouv. Tabl. Règne Anim., 1842, 67.

Mephitis chinche, FISCH., Syn., 1829, 260 (partly).

Mephitis mesomelas, LICHT., Darst. Säug., pl. 55, f. 2.—BD., Mamm. N. A., 1857, 199.

Mephitis varians, GRAY, Mag. N. H., i, 1837, 581.—BD., Mam. N. A., 1857, 193.

Mephitis macroura, AUD. & BACH., Quad. N. A., iii, 1853, 11, pl. 102 (*not of* Licht).

Mephitis occidentalis, BD., Mam. N. A., 1857, 194.

A number of skunks were killed by the party, but none brought in. They are said to be quite common. It is a matter of some interest with regard to this beautiful little animal that the Rev. Dr. Hovey, in “Silliman’s Journal” for May, 1874, states its bite, under certain conditions, is capable

of producing a disease analogous to *rabies canina*—the hydrophobia of dogs—and for which he claims the name *rabies mephitica*. He asserts that the salivary virus is only dangerous when there is a corresponding diminution or disappearance of the peculiar offensive fluid which it uses for defensive purposes. A paper, however, is now in course of preparation by Dr. Janeway, of the United States Army, which, it is expected, will disprove the truth of Dr. Hovey's theory. Should Dr. Hovey's theory eventually prove true, the *Mephitis* should be as ruthlessly exterminated as the *Crotalona* (Rattlesnake).

Subfamily MELINAE.

Genus TAXIDEA, Waterhouse.

TAXIDEA AMERICANA, (Bodd.) Bd.

American Badger.

Meles taxus var. *americanus*, BODD., Elenchus Animalium, i, 1784, 136.

Meles americanus, ZIMM., Penn. Arktische Zool., i, 1787, 74 (after Boddært).

Taxidea americana, BAIRD, Mamm. N. A., 1857, 202, pl. 39, f. 2.—NEWB., P. R. R. Rep., vi, 1857, 45.—COOP. & SUCKL., N. H. Wash. Terr., 1860, 117.—HAYD., Trans. Amer. Phil. Soc., xii, 1862, 143.—GRAY, P. Z. S., 1865, 141.—COOP., Am. Nat., ii, 1868, 529.—STEV., U. S. Geol. Surv. Terr. 1870, 1871, 461.—ALLEN, Pr. Bost. Soc., xiii, 1869, 183.—ALLEN, Bull. Ess. Inst., vi, 1874, 46, 54, 59, 63.—ALLEN, Proc. Bost. Soc., xvii, 1874, 38.—AMES, Bull. Minn. Acad., 1874, 69.

Ursus labradorius, GM., S. N., i, 1788, 102.

Meles labradoria, MEYER, Zool. Arch., ii, 1796, 45.—J. SAB., App. Frankl. Jour., 1823, 649.—DEKAY, N. Y. Zoöl., i, 1842, 27.—AUD. & BACH., Quad. N. A., i, 1849, 360, pl. 47.

Taxus labradoricus, SAY, Long's Exp., i, 1823, 261, 369.

Meles jeffersonii, HARLAN, Fn. Amer., 1825, 309.

Very common throughout Western Utah and Eastern Nevada. Several fine skins and crania were obtained. Less abundant in New Mexico and Arizona.

Subfamily LUTRINAE.

Genus LUTRA.

LUTRA CANADENSIS, (Turton) Cuv.

North American Otter.

Mustela canadensis, TURTON, Syst. Nat., i, 1806, 57 (not of the same work, p. 59, nor of Schræber, Erxleben, and authors. This reference, which appears to have been wholly overlooked heretofore, is the first we have found for the species).

- Lutra canadensis*, F. CUV., Dict. Sc. Nat., xxvii, 1823, 242.—SABINE, App. Frankl. Jour., 1823, 653.—LESS., Man., 1827, 154.—GRIFF., Anim. Kingdom, v, 1827, 130.—FISCH., Syn., 1829, 225.—RICH., F. B.-A., i, 1829, 57.—DEKAY, N. Y. Zoöl., i, 1842, 39.—WOODH., Sitgr. Rep., 1853, 44.—AUD. & BACH., Q. N. A., ii, 1851, 2, pl. 51.—BD., M. N. A., 1857, 184.—HAYD., Tr. Am. Phil. Soc., xii, 1862, 143.
- Lutra canadensis*, var., AUD. & BACH., Q. N. A., iii, 1853, 97, pl. 122 (fig. of Gray's type of "*Lataxina mollis*").
- Latax canadensis*, GRAY, P. Z. S., 1865, 133.
- Lutra vulgaris* var. *canadensis*, WAGN., Suppl. Schreber, ii, 1841, 256.
- Lutra hudsonica*, FR. CUV., Suppl. Buff., i, 1831, 194.
- Lutra brasiliensis*, DESM., Mam., i, 1820, 188 (in part).—HARL., Fn. Amer., 1825, 71 (in part).—GODM., Am. Nat. Hist., i, 1831, 222 (in part).—THOMPS., Vermont, 1853, 33.
- Lutra lataxina*, F. CUV., Dict. Sc. Nat., xxvii, 1823, 242.
- Latax lataxina*, GRAY, Ann. Mag. N. H., i, 1837, 119.
- Lataxina mollis*, GRAY, List. Mam. Br. Mus., 1843, 70.
- Lutra americana*, WYMAN, Pr. Bost. Soc., ii, 1847, 249.
- Lutra californica*, BD., M. N. A., 1857, 187.
- Lutra destructor*, BARNSTON, Canada Nat. & Geol., viii, 1863, 147, f. —.
- Loutre d'Amérique, partim*, CUV., R. A., i, 3d ed., 1836, 91 (mixed with true *brasiliensis*)

The otter is found sparingly in some of the fresh water lakes of various portions of the regions explored; but no specimens were secured.

FAM. PROCYONIDAE.

Genus PROCYON, Storr.

PROCYON LOTOR, (Linn.) Storr.

Raccoon.

- Ursus lotor*, LINN., Syst. Nat., i, 1758, 48; 1766, 70.—SCHREB., Säug., iii, 1778, 521.—ERXL., Syst. An., 1777, 165.—GM., Syst. Nat., i, 1788, 103.—HARLAN, Fn. Amer., 1825, 53.
- Procyon lotor*, STORR, Prod. Meth. Anim., 1780, —.—DESM., Mamm., i, 1820, 168.—GRIFF., An. Kingd., v, 1827, 114.—FISCHER, Syn., 1829, 147.—RICH., Fn. Bor.-Amer., i, 1829, 36.—DOUGHTY'S Cab. N. H., ii, 1832, 73, pl. 7.—DEKAY, N. Y. Zoöl., i, 1842, 26.—AUD. & BACH., Q. N. A., ii, 1851, 74, pl. 61.—BAIRD, Mam. N. A., 1857, 209.—ALLEN, Bull. M. C. Z., i, 1869, 181; ii, 1871, 170.
- Meles lotor*, BODD., Elenchus Animalium, 1784, 80.

Observed in Colorado.

As we have not completed our studies of this animal, we refrain from citing, in the above list of references, several names, which, nevertheless, we believe belong to the synonymy of this species.

FAM. URSIDÆ.

Genus URSUS, L.

URSUS ARCTOS HORRIBILIS.

Grizzly Bear; "Cinnamon Bear" of mountaineers.

- Ursus horribilis*, ORD, Guthrie's Geog., 2d Am. ed., ii, 1815, 291, 299.—SAY, Long's Exp. R., Mts., 1823, 53.—DOUGHTY'S Cab. Nat. Hist., i, 1831, 121, pl. 11.—GODM., Am. Nat. Hist., i, 1831, 131.—BAIRD, Mamm. N. A., 1857, 219.
- ? *Ursus horribilis* var. *horriæus*, BD., U. S. Mex. B. Surv., ii, pt. ii, 1859, Mamm., 24.
- Ursus ferox*, RICH., Fn. Bor.-Am., i, 1829, 24, pl. 1.—FISCH., Syn., 1829, 144.—AUD. & BACH., Q. N. A., iii, 1853, 141, pl. 131.
- Ursus cinereus*, DESM., Mamm., i, 1820, 164.—HARL., Fn. Amer., 1825, 48.—GRAY, P. Z. S., 1864, 690.
- Ursus candescens*, H. SMITH, Griff. Cav., ii, 1827, 229; v, 1827, 112.
- Ursus arctos*, var., MIDDENDORFF, Sibir. Reise, ii, pt. ii, 1853, 4, 54, 61.
- Ursus arctos*, ALLEN, Bull. M. C. Z., ii, 1871, 170 (mixed with several other species or varieties).

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
15 C	U. horribilis	Grass Valley, Utah.....	——, 1873	E. E. Howell	Cranium.

Found from the plains of the Upper Missouri to the Rocky Mountains, and along their bases; thence to the coast of California. Several seen by the party in New Mexico, and a fine cranium obtained in Utah by Mr. Howell.

Although no bears were seen on the expedition of 1872, yet evidence was received at Fillmore of the occasional presence of one of these monsters in the Wahsatch Mountains behind the town. Our informant was an old hunter, thoroughly acquainted with the Cinnamon Bear (*Ursus americanus*, var. *cinnamomus*, Aud. & Bach.), which is frequently miscalled "the grizzly"; and he stated positively that the bear in question was entirely different. Many attempts had been made to capture him, but without success.

A grizzly bear, apparently two years old, was obtained on the northern slope of Bill Williams' Mountain. Several were killed in this same locality by the party to which Dr. Coues was attached in 1864. They are quite common in the vicinity of Camp Apache.

In 1874, Lieutenant Marshall obtained a skin of this bear, killed near Pagosa Hot Springs, in Western Colorado.

In the present state of our unfinished studies of the American *Ursidæ*, we are unwilling to express ourselves upon the nicer questions involved; but so far we can see we have in the United States two perfectly distinct species, to which a third, the Barren Ground Bear, of Richardson, named *Ursus richardsoni*, by one Mayne Reid, may require to be added.

These two are the "Black Bear" (*Ursus americanus*) and the Grizzly, the latter probably not specifically separable from the *U. arctos* of Europe. Both occur under almost every variation in color, but preserve their specific characters throughout.

The "Cinnamon Bear" of *authors* is a variety of *U. americanus*; but the "Cinnamon" Bear of frontiersmen and mountaineers refers to some of the lighter or browner varieties of the Grizzly.

URSUS AMERICANUS, Pall.

Black Bear.

Var. AMERICANUS.

Ursus americanus, PALLAS, Spic. Zoöl., xiv, 1780, 6.—BODD., Elench. Anim., i, 1784, 79.—GMEL., Syst. Nat., i, 1788, 101.—DESM., Mamm., i, 1820, 165.—HARLAN, Fn. Amer., 1825, 51.—RICH., F. B. A., i, 1829, 14.—FISCH., Syn., 1829, 143.—GODM., Am. Nat. Hist., i, 1831, 114.—DEKAY, N. Y. Zoöl., i, 1842, 24.—AUD. & BACH., Q. N. A., iii, 1853, 187, pl. 141.—BD., M. N. A., 1857, 225.

Ursus niger americanus, GRIFF., An. Kingd., v, 1827, No. 318.

Var. CINNAMOMEUS.

Ursus americanus var. *cinnamomum*, AUD. & BACH., Q. N. A., iii, 1853, 125, pl. 127.

Ursus americanus var. *cinnamoneus*, BD., Mamm., N. A., 1857, 228.

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
15 D	<i>U. americanus</i> ...	White Mountains, Ariz ..	———, 1873	Dr. C. G. Newberry	Skin.

Widely distributed throughout North America, and quite numerous in the three Territories visited. In one locality, in the Miembres Mountains, a number were seen. Mr. Henshaw records the fact that one of the hunters

of the party killed a female bear having with her two cubs, one quite black in color and the other brown, and this, it is stated, is not uncommon. One fine skin obtained.

This animal is very frequently found in nearly the whole of the hilly and wooded country of Arizona. The Coyotero and Mogollon Mountains appear to be the home of this class of animals. Skins were often brought into camp by the Indians at Camp Apache.

Skins of var. *cinnamomeus* were obtained at Camp Apache, and it was also seen at Bill Williams' Mountain, and is chiefly found along the eastern border of Arizona and into New Mexico. Obtained by Lieutenant Marshall at Pagosa Hot Springs, Western Colorado, in 1874.

UNGULATA.

FAM. BOVIDÆ.

Genus BOS, L.

BOS AMERICANUS, Gm.

Buffalo.

Taurus mexicanus, HERNAND., Mex., 1651, 587, ♂.

Taureau sauvage, HENNEPIN, Nouv. Discov., i, 1699, 186.

Buffalo, LAWSON, Car., 1709, 115.—SAY, Long's Exp., iii, 1823, 68.

Bos bison, L., Syst. N., i, 1766, partly.

Bos americanus, GM., Syst. Nat., i, 1788, 204.—DESM., Mamm., ii, 1822, 496.—HARL., Fn. Amer., 1825, 268.—GODM., Am. Nat. Hist., iii, 1831, 4.—RICH., F. B. A., i, 1829, 279.—DOUGHTY'S Cab. N. H., ii, 1832, 169, pl. 14.—GIEBEL, Säug., 1855, 271.—MARCY, Rep. Red River, 1852, 201.—WOODH., Sitgr. Rep. Zuñi & Colorado, 1854, 57.

Bison americanus, GRIFF., An. Kingd., v, 1827, 374.—TURNER, P. Z. S., 1850, 174.—BAIRD, Agric. Rep. U. S. Patent Office 1851, 1852, 124.—AUD. & BACH., Q. N. A., ii, 1851, 32, pls. 66, 67.

Not common in Colorado, but a few individuals in 1873 visited South Park. One female was killed and calf captured.

In Arizona, Dr. Coues obtained some years since evidence considered satisfactory of the former presence of the Buffalo in that Territory, where it is now entirely unknown.

Formerly quite common in Utah, as it is still remembered by the older Indians. We were informed by Mr. Peter Madsen, an intelligent fisherman of Utah Lake, that in drawing his nets in that body of water he has frequently hauled up the skulls of Buffaloes, and it is supposed that, driven across the plains by the Indians upon the ice in the winter season, they broke through and were drowned.

FAM. OVIDÆ.

Genus **APLOCERUS**, H. Smith.

APLOCERUS COLUMBIANUS, (Desmoul.) Coues.

Rocky Mountain Goat.

- Capra columbiana*, DESM., Dict. Class., iii, 580.—FISCHER, Syn., 1829, 487.
Ovis montana, ORD, Guth. Geog. 2d Am. ed., ii, 1815, 292, 309; Journ. Acad. Nat. Sc. Phila., i, 1817, 8; Jour. de Phys., lxxxv, 1817, 333.
Capra montana, HARL., Fn. Amer., 1825, 253.—GODM., Am. Nat. Hist., ii, 325.
Aplocerus montanus, RICHL., Zoöl. Voy. Herald; Foss. Mamm., ii, 1852, 131, pls. 16-19 (Osteology. Named *Rupicapra americana* on plate).—BD., Mamm. N. A., 1857, 671.
Antilope (Rupicapra) americana, BLAINV., Nouv. Bull. Soc. Philom., 1816, 73, 80.—DESMAR., Mamm., ii, 1822, 478.
Capra americana, RICHL., F. B. A., i, 1829, 268, pl. 22.—OGILBY, P. Z. S., 1836, 137.—BD., Agric. Rep. U. S. Patent Office for 1851, 1852, 120, pl.—AUD. & BACH., Q. N. A., iii, 1853, 128, pl. 128.
Mazama americana, GRAY, P. Z. S., 1850, 136.
Aplocerus americanus, TURNER, P. Z. S., 1850, 174.
Mazama sericea et dorsata, RAF., Am. Monthly Mag., i, 1817, 44.
Antilope lanigera, H. SMITH, Linn. Trans., xiii, 1822, 38, pl. 4.

One individual seen in Colorado by Lieutenant Marshall's party.

Seen by Captain Anderson, of the British Boundary Commission, in 1874, in Rocky Mountains, near Chief Mountain Lake, lat. 49°.

Genus **OVIS**, L.

OVIS MONTANA, Cuv.

Rocky Mountain Sheep.

- Ovis ammon*, MITCH., Med. Repos., x, 1807, 35.—ORD., Guthrie's Geog., 2d Am. ed., ii, 1815, 292, 308.—HARL., Fn. Amer., 1825, 164.—GODM., Amer. Nat. Hist., ii, 328.

Ovis montana, CUV., Règne Anim., i, 1817, 267.—DESM., Mamm., ii, 1822, 487.—RICH., F. B. A., i, 1829, 271, pl. 23.—DOUGHTY'S Cab. Nat. Hist., i, 1830, 193, pl. 17.—MAXIM., Reise Nord-Am., i, 1839, 549.—AUD. & BACH., Q. N. A., ii, 1851, 163, pl. 73.—BD., Agric. Rep. U. S. Patent Office 1851, 1852, 123, pl.—; Stansbury's Rep., 1852, 312; Mam. N. A., 1857, 673, figs.—WOODH., Sitgr. Rep. Zuñi & Colorado, 1854, 56.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 40.

Capra (Ovis) montana, FISCH., Syn., 1819, 488.

Ovis cervina, DESM., Nouv. Dict., xxi, 1818, 553.

Ovis pygargus, H. SMITH.—GRIFF., An. Kingd., v, 1827, 359.

Ovis californianus, DOUGLAS, Zoöl. Journ., iv, 1829, 332.

Ovis californica, WAGN., Suppl. Schreb., v, 1836, 1371.

"*Belier de montagne*, GEOFF., Ann. du. Mus., ii, 1803, 351, pl. 60" (quoted by Fischer as "*Ovis montana*").

Bighorn, LEWIS & CLARK. *Mouflon d'Amérique*, DESM., l. c.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
40 L	<i>O. montana</i>	Near Santa Fé, N. Mex..	——, 1873	Governor Arny....	Cranium.
40 M	.....do	——, N. Mex	——, 1873	Dr. C. G. Newberry	Do.

Common in mountainous portions of the regions explored.

FAM. ANTILOCAPRIDÆ.

Genus ANTILOCAPRA, Ord.

ANTILOCAPRA AMERICANA, Ord.

Antilope americana, ORD, Guthrie's Geog. 2d Am. ed., ii, 1815, 292, 308.—HARL., Fn. Amer., 1825, 250.—GODM., Am. Nat. Hist., ii, 320.

Antilocapra americana, ORD, Journ. de Phys., lxxxvii, 1818, 149; Bull. Soc. Philom., 1818, 146.—GRAY, P. Z. S., 1850, 137.—AUD. & BACH., Q. N. A., ii, 1851, 193, pl. 77.—MARCY, Rep. Expl. Red River, 1852, 201.—WOODH., Sitgr. Rep. Zuñi & Colorado, 1854, 56.—BD., Mamm. N. A., 1857, 666.—TENNEY, Man., 1866, 101.—ALLEN, Proc. Bost. Soc., xvii, 1874, 40.—COOP., Am. Nat., ii, 1869, 537.

Dicranoceros americanus, TURNER, P. Z. S., 1850, 174.

Cervus hamatus, BLAINV., "Bull. Soc. Philom., 1816, 73" (as quoted by Fischer, l. c.).

Antilope furcifer, H. SMITH, Trans. Linn. Soc., xiii, 1822, 28, pl. 2.—DESM., Mamm., ii, 1822, 479.—RICH., F. B. A., ii, 1829, 261, pl. 21.—FISCHER, Syn., 1829, 481.

Mazama furcifer, OGILBY, P. Z. S., 1836, 121.

Dicranoceros furcifer, SUND., K. Sv. Vet. Handl., 1844.

Antilope palmata, H. SMITH, Trans. Linn. Soc., xiii, 1822, 31, pl. 3.—DESM., Mamm., ii, 1822, 479.—FISCH., Syn., 1829, 481.

Pronghorn Antelope, HAYES, Am. Nat., ii, 1868, 131, figs. — (biography and physiology).

One specimen of this beautiful animal was found in Spring Valley, Nevada. Hundreds of them were seen on the Colorado plateau, especially around Bill Williams' Mountain.

Very common on plains to westward of Sink of the Sevier. Common on plains west of Missouri. Visits the mountains near South Park, Colorado, to herd, in June and July (*fide* Rothrock).

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
150 ♂	A. americana	South Park, Colo	Aug. 1, 1873	Dr. J. T. Rothrock.	Cranium.
150 a	.....do	——, N. Mex	——, 1873	H. W. Henshaw ..	Skin and cranium.

FAM. CERVIDAE.

Genus CERVUS, L.

CERVUS CANADENSIS, Erxl.

Wapiti or American Elk.

- Cerv de Canada*, PERRAULT, Mém. Acad. Roy. Sci., iii, 65, pl. 45 (prior to 1709).
Hert van Kanada, HOUTT., Nat. Hist., iii, 83, pl. 22, f. 1 (subsequent to 1761).
Hirsch von Canada, MÜLL., Natursyst., i, 1773, 393, pl. 21, f. 1 (*ex* Houtt.)
Cervus canadensis, BRISS., Quad., 1756, 88.
Cervus elaphus γ, *canadensis*, EXL., Syst., 1777, 305.—BODD., Elench. Anim., 1784, 135.
Cervus canadensis, SCHREB., Säug., v, "1835," 990, pl. 246 A.—DESMAR., Mamm., ii, 1822, 433.—HARL., Fn. Amer., 1825, 236.—GODM., Am. Nat. Hist., ii, 1831, 294, pl. —.—MAXIM., Reise, ii, 1839, 24, 84.—GRAY, P. Z. S., 1850, 226.—PUCH., Archiv. du Mus., vi, 1852, 386.—GIEBEL, Säug., 1855, 348.—BAIRD, Mam. N. A., 1857, 838, figs. 9. 10.
Cervus (Elaphus) canadensis, GRIFF., An. Kingd., v, 1827, 308.
Elaphus canadensis, DEKAY, N. Y. Zoöl., i, 1842, 118, pl. 18, f. 2.—AUD. & BACH., Q. N. A., ii, 1851, 84, pl. 62.—BAIRD, Agric. Rep. U. S. Patent Office for 1851, 1852, 116.
Cervus strongloceros, SCHREB., Säug., v, "1836," pl. 247, F, G.—RICH., Fn. Bor.-Am., i, 1829, 251; Zoöl. Beechey's Voy., 1839, 10.—SUNDEV., Kong. Vet. Ak. Handl., 1844; Arct. Scand. Beit., ii, 1850, 131.
Cervus wapiti, BARTON, Am. Philos. Trans., vi, 1809, 70; Med. & Phys. Journ., iii, 36.—LEACH, Journ. Phys., lxxxv, 1817, 67.
Cervus major, ORD, Guthrie's Geog., 2d Am. ed., ii, 1815, 292, 306; Journ. Phys., lxxxvii, 1818, 150.—DESM., Mamm., ii, 1822, 432.
? *Cervus occidentalis*, H. SMITH, Griff. An. King., iv, 1827, 101; v, 1827, 308 (quote *Cervus auritus*, WARDEN, and *Mule Deer*, LE RAYE).

Although this animal was not actually observed, Indians of Nevada spoke of its occurrence there, and had in their possession skins and horns said to have been obtained in the mountains.

Remains of a Moose (*Alce americana*), said to have been killed in South Park, Colorado, in 1871, were observed by the expedition. The statement is open to doubt; if correct, it fixes the southernmost limit of the species.

Genus CARIACUS, Gray.

CARIACUS MACROTIS, (Say) Gray.

Mule Deer; Black-tailed Deer.

Cervus macrotis, SAY, Long's Exp., ii, 1823, 88.—HARL., Fn. Amer., 1825, 243.—GODM., Amer. Nat. Hist., ii, 1831, 204.—PEALE, "Phila. Advoc. Sci., i, 1834, 11; U. S. Expl. Exped., 1848".—WAGN., Suppl. Schreb., iv, 1844, 371, partly; v, 1855, 368.—PUCHER., Arch. du Mus., vi, 1852, 369.—WOODH., Sitgr. Rep., 1854, 55.—GIEBEL, Säug., 1855, 342.—NEWB., P. R. R. Rep., vi, 1857, 68.—BAIRD, Mamm. N. A., 1857, 656, figs. 19, 20.—SUCKL., P. R. R. Rep., xii, 1859, 135.—BD., U. S. Mex. B. Surv., ii, pt. ii, 1859, Mamm., 51.—COUES, Am. Nat., i, 1868, 535.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874.—TENNEY, Man. Zoöl., 1866, 93.—COUES, Proc. Acad. Nat. Sci. Phila., 1867, 136.—ALLEN, Bull. Essex Inst., vi, 1874.

Cervus (Cariacus) macrotis, GRAY, Knowls. Men., 1850, 67; P. Z. S., 1850, 239.

"*Cervus auritus*, WARDEN."

Mule Deer, LEWIS & CLARK, i, 77.—HAYES, Am. Nat., iii, 1869, 180 (biography).

? *Cerv Mulet*, DESM., Mamm., ii, 1822, 43.

Great-eared Deer, GRIFF., Anim. Kingd., iv, 1827, 133.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
R. S. 2	<i>C. macrotis</i>	Gunnison River, Colo ...	——, 1873	Northington	Cranium.
R. S. 3	.....do	(?)	——, 1873	Dr. C. G. Newberry	Do.

An abundant and generally diffused species throughout the West, but especially east of the Rocky Mountains, where it is the only Black-tailed Deer certainly known to be of regular occurrence. West of the mountains, it is associated with *C. columbianus*, the true Black-tailed Deer, an apparently distinct species.

CARIACUS VIRGINIANUS MACRURUS, (Raf.) Coues.**White-tailed Deer.**

Cervus macrourus, RAF., Am. Monthly Mag., i, 1817, 436.—H. SMITH, Griff. An. Kingd., iv, 1827, 134; v, 1827, 316 (Kansas).

Cervus leucurus, DOUGL., Zoöl. Journ., iv, 1829, 330.—RICH., F. B. A., i, 1829, 258; Zoöl. Beechey's Voy., 1839, 10.—WAGN., Suppl. Schreb., iv, 1844, 375; v, 1855, 372.—PUCH., Mon. du Cerf. Arch. du Mus., vi, 1852, 322.—AUD. & BACH., Q. N. A., iii, 1853, 77, pl. 118.—NEWB., P. R. R. Rep., vi, 1857, 67.—SUCKL., P. R. R. Rep., xii, 1859, 134.—BAIRD, Mamm. N. A., 1857, 649.—COUES, Am. Nat., i, 1868, 537.—TENNEY, Man. Zoöl., 1866, 98.—STEV., U. S. Geol. Surv. Terr. 1870, 1871, 462.

Long-tailed Red Deer, LEWIS & CLARK.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
190	<i>C. leucurus</i>	San Luis Valley, Colo ...	Sept., 1873	Dr. J. T. Rothrock.	Cranium.
191 ♀	.....do .....	.....do .....	.....do .....	.....do	Do.

Observed in Colorado, where it was common in the vicinity of swampy valleys.

There is no question of the impropriety of separating this animal specifically from *C. virginianus*. The point, indeed, is whether the differences are sufficient to constitute a fair geographical race. We, however, present it provisionally as such. The above name is adopted from the *Cervus macrourus* of Rafinesque, of prior date to *leucurus* of Douglas; the two being undoubtedly synonymous. The animal is of general distribution in the West, like the true *C. virginianus* in the East, and is associated in most of its range with the very different *C. macrotis*.

CARIACUS VIRGINIANUS, var.**Dwarf Deer of Arizona.**

Cervus mexicanus, BAIRD, Mamm. N. A., 1857, 653 (whether of authors?).

Cervus virginianus var. *couesi*, ROTHROCK, MSS.

No. 657, Camp Crittenden, Ariz., Sept., 1874, *Dr. J. T. Rothrock*; ♂, with horns in the velvet.—The animal to be here described is clearly of the *C. virginianus* type, as shown by the characters of the horns and tail, but is much smaller and otherwise different.

The horns, still in the velvet, but beginning to polish, and probably about full grown, are like those of *C. virginianus*, in showing a strongly curved main beam, with the tines springing from its upper border, instead of the doubly dichotomous construction witnessed in *C. macrotis* and *columbianus*. The first tine, $2\frac{1}{2}$ inches long, springs about the same distance above the burr; the next, and main tine, 6 inches long, springs midway between the first and the forking of the beam. This forking results from the approximately equal size of the main beam and distal tine (4 or 5 inches); but its lower prong is clearly seen to be the main shaft of the horn, thus carrying out completely the pattern characteristic of *C. virginianus*. The ends of the horns are only $4\frac{1}{2}$ inches apart, and about $7\frac{1}{2}$ inches distant each from the burr of its own side. The ends of the main tines are 10 inches apart; the width of the horns across at the broadest point is only about 13 inches.

The tail is like that of *C. virginianus* in form and color, but much smaller. It is broad, flat, lanceolate, and somewhat distichous. The vertebrae are only about 5 inches long (as well as can be judged from the state of the specimen), beyond which the hairs project 3 inches. The ears are shaped as in *C. virginianus*, but are smaller and only very scantily pilous outside, where the skin is in plain view; inside, they are better clothed with long flocculent hairs on the concavity itself, and a closer pilous coat on the edge and flat terminal part.

The distance from the end of the metacarpal bone to the tips of the hoof is a short 11 inches. The sole of the fore hoof is 2 inches long by $1\frac{3}{8}$ broad. The distance from the heel to the end of the hind hoofs is $15\frac{3}{4}$ inches, of which the calcaneal portion is about 3 inches, and the digital portion 4. The hind hoofs are shorter and especially narrower than the fore. Both hoofs are black, as are also the false hoofs. As well as can be determined in the dried state, the metatarsal glands are small and like those of *C. virginianus*.

The prevailing coloration of this animal, taken in September, which is still "summer" in Arizona, is a pale, dull fawn color, with a peculiar ochreous shade, brightening into clearer tawny or reddish-brown all around where the color of the upper parts joins the white of the under portions, and on

the dorsal area becoming insensibly darkened in tone by an intimate admixture of mouse-gray. On this darkened area, the color is a blended grizzle of the mouse-gray with pale fawn or nearly colorless ends of the hairs. The tail is rich reddish brown on the central field above, fringed and tipped with white, and pure white below. Some of the terminal reddish hairs have a slight blackish tipping, but the sum of this scarcely produces a noticeable effect. The fore limb inside is white throughout, and whitish all around the digits; the hind limb is perfectly white inside only above the heel, and whitish all around the digits; both sides of the metatarsus being colored. The ears are dark mouse-gray outside, bleaching at the edges; the hairs inside are pure white. The forehead is extensively dusky; the naked muffle and the abundant eye-lashes are jet black.

No. 656, ♀, collected in the same place, at the same time, shows no tangible differences in color. It is, of course, considerably smaller than the buck.

A doe, killed in May, 1855, by Dr. C. B. R. Kennerly, at San Luis Springs, which furnished Professor Baird's account of *C. "mexicanus"*, is thus described as to color: "The prevailing color of this animal is an ashy brown, pointed with light gray or dull whitish. The hairs themselves are generally light gray at the base; the terminal portion becoming of a pure brown, (without any shade of red or yellow,) darkest near the tip, where it is rather broadly annulated with light gray, clearer than at the base, and with perhaps a faint tinge of yellowish. The under surfaces are lighter; the only pure white appears to have been in the inguinal region. The tail is entirely white beneath and all round. At the base above it is gray like the back; the sub-terminal portion is whitish, with a pale rufous tinge. The bases of the hairs above, however, except perhaps at the extreme end of the tail, are dark brown, darkest toward the tip. The head, including the convexity of the ears, presents the same grayish or pepper-and-salt color of the rest of the body. The end of the muzzle is encircled by a dusky ring, passing just behind the naked muffle; this ring is quite distinct on the side of the lower jaw, but for the rest is rather obsolete, being replaced by a grayish shade. The side of the muffle on either side of the nostrils and the tip of the chin are white. There is an increased amount of light in the

mottlings of the muzzle just behind the dark band referred to, but no distinctly light ring. The under surface of the head is white."

The under jaw of the buck taken by Dr. Rothrock measures $7\frac{2}{3}$ inches from the back of the condyle to the ends of the incisors. The skull of the doe gives the following measurements:

	<i>Inches and decimals.</i>
Occipital condyles to apex of intermaxillaries.....	8.25
Back of mandibular condyles to ends of incisors.....	6.90
Apex of coronoid to ends of incisors.....	7.50
Height of condyle above angle of jaw	3.25
Width of skull across orbits.....	3.75
Interzygomatic width	3.50
Interparoccipital width	1.75
Length of nasal bones.....	2.65

Specimens.

No.	Name.	Sex.	Locality.	Date.	Collector.	Remarks.
656	<i>Cervus virginianus</i> , var..	♀	Crittenden, Ariz.	Sept. 10, 1874	Dr. Rothrock.	Skin and skull.
657	.....do .....	♂	.....do .....	.....do .....	.....do	Skin, skull, and horns.

This is the animal carefully described by Professor Baird in 1858 as *C. mexicanus*, Gm.; but he applied this name provisionally, remarking that there was some doubt whether it was the true *C. mexicanus* of authors or not. According to the descriptions, the *C. mexicanus*, to which is ascribed a range from Mexico to Brazil, appears to be distinct from *C. virginianus*; but the present animal is beyond doubt only a small southern form of that wide ranging species, to which it must unquestionably be referred. Dr. Rothrock's specimens fix its characters with the desired precision; but further comparisons with more material from Mexico and Central America will be required to establish its relationships to the small deer of those countries. Should it prove distinct from these, it may bear the name applied to it in Dr. Rothrock's MSS.; but at present we are indisposed to formally recognize this designation.

The foregoing account may be properly supplemented by the notice published recently by Dr. Rothrock in the "American Sportsman," which gives measurements taken in the flesh, and various interesting particulars respecting the general appearance and habits of this deer.

"During the past season, that portion of Lieutenant Wheeler's party to which I was attached, operating in Southern Arizona, found a small deer quite abundant there. The skins obtained have not yet [i. e., had not then] reached Washington. There can be but little doubt, however, that they will prove the much desired Dwarf Sonora Deer.

"I may as well state at the outset that zoölogists are in doubt as to whether *Cervus mexicanus* (Gmelin) is a valid species, or whether it is a dwarf southern form of our common Virginia Red Deer. It is well known that such a decrease in size as we proceed south is not unusual among mammals. Notwithstanding this fact, I am inclined to think the deer in question will yet prove distinct from the Red Deer. This, however, is a matter for zoölogists to settle.

"Taking the longitude of Mount Graham and going south from this point to the boundary between Arizona and Sonora, we find it nowhere rare, and in some places quite common. It ranges as far north as the valley of the Gila River, and may, indeed, reach a point still farther north; but it is evidently supplanted in the White Mountains of Arizona by the ordinary White-tailed Deer. I find in the volume already cited, the range of *Cervus mexicanus* given as "the Gadsden line" on the north, and the woody mountain region south as far as the city of Mexico, or a range just such as we might expect for the deer of our collection. There is, however, a slight discrepancy in the measurements of Dr. Kennerly and myself; his *doe* weighing "not over seventy pounds", while the largest of three does shot by myself did not exceed sixty, and the smallest adult doe (whose udder was distended with milk) would hardly reach forty pounds. I did shoot one large and very poor doe, weighing nearly ninety pounds; but this was so evidently an ordinary White-tail, that I do not include it in what I may say regarding the smaller form. Neither of two fat, four-prong bucks that I killed exceeded seventy pounds in weight. The measurements taken by me will suffice to show that there is a much less difference in height between our deer and the Dwarf Deer than there is in girth. In fact, the latter is much more light and airy in all its movements. It stands up so well, however, that the hunter, shooting at it for the first time, might readily enough take it to be the Virginia Deer. On cutting the meat from the bones preparatory to jerking

it, I found that all we obtained from a doe would go into a small camp-kettle.

“A very fat four-pronged buck taken by myself gave the following measurements:

	<i>Inches.</i>
From tip of nose to between eyes	6
From tip of nose to between horns	10
From butt to tip of horns (following curve)	13
Length of longest antler	7
From horns to interscapular hollow	15½
From interscapular hollow to root of tail ...	25
From root to tip end of hair of tail	9
From top of rump to hind-toe tip	35½
From top of shoulder to tip of fore toe	32
Around chest at ensiform cartilage (animal eviscerated)	33
Around loins (animal eviscerated)	25¼
Heel to tip of toe	15½
Top of rump to heel	19¾
Between inner angle of eyes	4
Length of ears	7¾

“August 28, I shot an adult doe that had no fawn, and was therefore in good condition. The following are her measurements; her weight was not over fifty-five pounds:

	<i>Inches.</i>
Nose to eye	6
Nose to top of head	8
Ears to interscapular hollow	12
Interscapular hollow to root of tail	21
Root of tail to extreme tip	9¼
Top of rump to tip of hind toe	33
Interscapular hollow to tip of fore toe	28
Heel to tip of hind toe	12
Between inner angles of eyes ...	2½
Length of ears	7
Around chest at ensiform cartilage	27
Around loins	19¼

“Turning now to a more popular side of the subject, I may say that nowhere else in North America have I seen deer more abundant than these Dwarf Deer were in Southern Arizona, nor have I anywhere more thoroughly enjoyed the sport of hunting them. True, it was unsportsmanlike to shoot down a doe that it was morally certain had a fawn secreted in some clump of bushes near by; but then it was done partly in the interest of science, and

partly because, in the absence of other fresh meat, we were obliged to do so. Either reason will probably be sufficient to justify the act, and, with these extenuating circumstances in our favor, the sport was the same as we should have had a month or so later.

"I would here incidentally remark that while the meat was drying, immense numbers of the common "blow-flies" were attracted to the neighborhood of the camp, and, in default of some better place to deposit their surplus eggs, would place incredible numbers of them in any fold of our blankets that afforded a sufficiently dark location. In fact, so regularly and systematically was this done that we were obliged to make compact bundles of our blankets during the day to exclude the flies.

"On the lower grounds (which at one time was a uniform slope from the foot of the Santa Rita Mountains eastward, but now is everywhere intersected by small cañons worn out by the action of water), beautiful clumps of Emory's Oak were sparsely scattered over the surface, affording sufficient shade to make the intense heat tolerable, and yet were not dense enough to intercept a good shot, either running or standing. In each of these numerous cañons, a small stream of pure mountain water came tumbling from rock to rock, over precipice into chasm, and everywhere churning itself into foam; while, on the banks, luxuriant clumps of willow and scrub oaks alternated with sweet, nutritious gramma grass; thus making numberless retreats in which the deer might find shade, hiding places, and abundant food. In such places, the does, with their families, were usually found in August, during the heat of the day. The bucks, however, ranged from the foot to the top of the Santa Rita Mountains; thus taking in an altitude of from three to four thousand feet greater, having less heat to endure, and withal a greater security from stray hunters. They were found in great numbers among the rocks and conifers of this higher range, and obtained abundant food in the shorter bunch grasses and the tender twigs of the under-brush. In August, I found their kidneys covered with fat.

"A year previous to my visit, a buck had been wounded in the left fore leg, about the elbow. The lower part of the leg had sloughed off, and in this condition the animal was frequently seen by the hunters. He was finally killed during my stay, and on examination it was found that the stump of

the leg had perfectly healed, and been so constantly used by the deer when he was moving along the hillside that it had become as hard and leathery as the foot of a bear. This specimen will eventually be deposited in the Army Medical Museum at Washington.

“As a rule, it was easy to get within fair shooting distance of the game. This was due, not more to the conformation of the ground, than it was to the unsuspecting nature of the deer themselves. In fact, they were in this so unlike the Virginia Deer, that their general expression was rather that of curiosity and surprise, than fear at the approach of the hunter. Part of this may have been due to the fact that years ago the continual raids of the most relentless band of Apaches have driven out the Mexican civilization, which the stone irrigating ditches show had existed there, and that of late the Indians themselves had been excluded from the ground. In the short interval of tranquility, but few whites have come in. This then allowed the deer to multiply and become moderately tame, as indeed they usually do when very abundant. Number appears to give them a sense of security. In fact, any hunter who has the least instinct in approaching game may always get within fifty yards, and have a fair standing shot. It was not uncommon to find (as early as August), small bands of three or four deer; and on such occasions the hunter might generally have killed most or all of them. They usually went to water and in search of food *later* in the morning, and *earlier* in the evening, than the Virginia Deer, and not seldom were found busily feeding at noon.”

MONODELPHIA INEDUCABILIA.

CHIROPTERA.

In this order, we shall give the characters of the species and higher groups. The suborders and families may be readily determined by the following analysis; the features being subsequently worked out in greater detail:

I. ISTIOPHORA.

Bats with upright appendage on nose PHYLLOSTOMATIDÆ

II. GYMNORHINA.

Bats without upright appendage on nose.

- A. Nostrils circular; wing-membranes narrow; tail either much longer or shorter than interfemoral membrane.....NOCTILIONIDÆ.
- B. Nostrils subelliptical; wing-membranes ample; tail inclosed in interfemoral membrane; the final joint only in some instances exserted VESPERTILIONIDÆ.

FAM. PHYLLOSTOMATIDÆ.

Leaf-nosed Bats.

CHARS.—Rostrum surmounted by an upright appendage. This expression, though not diagnostic of the family among all its allies, distinguishes our representative from other North American bats.

Genus **MACROTUS**, Gray.

Macrotus, GRAY, Proc. Zool. Soc., 1843, 21.—ALLEN, Monog., 1.

CHARS.—Teeth: I., $\frac{2-2}{2-2}$; C., $\frac{1-1}{1-1}$; P., $\frac{2-2}{3-3}$; M., $\frac{3-3}{3-3} = \frac{16}{18} = 34$. Skull papery, with inflated cranial and tapering rostral portion and slight sagittal crest. Nose-leaf simple, erect, acuminate, triangular. Under lip cleft. Ears large, joined. End of tail exserted beyond interfemoral membrane.

MACROTUS WATERHOUSII, Gray.**Leaf-nosed Bat.**

Macrotus waterhousii, GRAY, Proc. Zool. Soc. Lond., 1843, 21.

Macrotus californicus, BAIRD, Proc. Phila. Acad., 1858, 117; Rep. Mex. B. Surv., 1859, ii, 4, pl. i, f. 2.—H. ALLEN, Monog., 3.—COUES, Am. Nat., i, 1867, 283.

Macrotus mexicanus, DE SAUSSURE, Rev. Mag. Zool., 1860, 486.

"*Megadermatidæ*, sp.?", J. A. ALLEN, Bull. Mus. Comp. Zool., iii, 175.

CHARS.—Central upper incisors large, chisel-shaped; the lateral small, pointed, converging; canines small, simple; anterior premolar thin, compressed, unicuspid, with small posterior basal snag; lower incisors crowded, obscurely trilobed; canines with basal snag; first and second premolars with basal ridge. Head long; face hairy; head nearly naked behind junction of the ears; eyes rather large, almond-shaped; nose-leaf acuminate, higher than broad; ears very large, oval, sparsely hairy, joined by a membrane. Tragus lanceolate; not quite half as high as auricle. Under lip cleft. Thumb slender, long. End of tail exserted. Heel large. Wing-membrane reaching ankle. Color grizzled or watered—the fur indistinctly tricolor—at base white, then fawn; at the tips gray on the upper parts of the body; white below. Length to end of tail, $3\frac{1}{4}$ –4 inches; expanse, 10–11; tail, $1\frac{1}{4}$ – $1\frac{2}{3}$; ear, about 1 high; fore-arm, $1\frac{1}{3}$ –2; shin, $\frac{2}{3}$ – $\frac{4}{5}$; nose-leaf, $\frac{1}{5}$ high.

HABITAT.—West Indies, Mexico, and southern border of the United States.

No species of this genus appears to have been recorded from the United States until Professor Baird described his *M. californicus*, based upon specimens procured at Fort Yuma, Cal., by Maj. G. H. Thomas, United States Army. Many others from Lower California, taken by Mr. J. Xantus, were subsequently noticed by Dr. H. Allen under the same name. There is little, if any, doubt, however, that this species is the same as the well-known West Indian *M. waterhousii*. The only tangible distinction noted by Dr. Allen is the color of the central portions of the hair—"fawn" instead of "dark brown"—and this may readily have arisen from conditions of alcoholic preservation or other circumstances. This identification is probably confirmed by Mr. J. A. Allen's discovery of a megadermatoid bat in Florida—the first noted from our Atlantic region. It is difficult to find any tangible specific characters in the *M. mexicanus* of De Saussure, after the careful consideration of his article we have made.

FAM. NOCTILIONIDÆ.

Free-tailed Bats.

Rostrum unappendaged. Nostrils circular. Alar membranes narrow, deeply excised. Tail much longer or much shorter than femoral membrane.

The typical *Noctilionidines* differ in figure remarkably from our ordinary bats, owing to the narrowness of the wings and the immense extent of the femoral membrane, which far surpasses the tail; the free tip of the latter resting against the parachute. The following genus, however, does not show these latter peculiarities.

Genus NYCTINOMUS, Geoffroy.

Nyctinomus, ET. GEOFFROY, Hist. Nat. de l'Égypte, 1814, ii.—IS. GEOFFROY, Ann. des Sc. Nat., 1824, i, 337.—CASTELNAU, Expl. d'Amér., Mammif., pl. xii, f. 2.—DE SAUSSURE, Rev. et. Mag. Zoöl., 1860, 283. —ALLEN, Monog., 5.

CHARS.—Teeth: I., $\frac{1-1}{2-2}$; C., $\frac{1-1}{1-1}$; P., $\frac{2-2}{2-2}$; M., $\frac{3-3}{3-3} = \frac{14}{16} = 30$. Upper incisors con-

vergent but separate; first premolar minute, second with a sharp inner cusp; lower incisors sharp, bilobed, crowned; lower canines slender, cusped; lower premolars of equal size, unicusped. Skull inflated, crestless, papery; rostrum large. Snout broad, prominent, piggish; lips thick, pendulous, furrowed; ears (in following species) united over the vertex; tragus broad, obtuse, squarish. Great toe apart from the others. Tail exerted beyond femoral membrane nearly half its length.

This genus belongs to the molossoid group of the family, but is at once distinguished from the large American genus *Mollossus* by having 2-2 instead of 1-1 upper premolars; furrowed instead of smooth lips; well developed tragus instead of a mere point of integument; large joined ears instead of moderate separate ones, etc. We have a single species of the genus, which is extensively distributed, not only in America, but in Africa and Australia.

NYCTINOMUS NASUTUS, (Spix) Tomes.

Snouty Bat.

Molossus nasutus, SPIX, "Sim. Vesp. Bras., 1823, 60, pl. 35, f. 7."

Dysopes nasutus, TEMMINCK, Mon. Mam., i, 1827, 233.—*Id.*, Zoöl. Journ., iii, 1828, 459 — WAGN., Suppl. Schreber, i, 1844, 474; v, 1855, 711.—SCHINZ, Syn., i, 143.

Nyctinomus nasutus, TOMES, Proc. Zoöl. Soc., 1861, 68.—H. ALLEN, Monog., 7.—J. A. ALLEN, Bull. Mus. Comp. Zoöl., ii, 174.

Nyctinomus brasiliensis, IS. GEOFFROY, Ann. Sci. Nat., i, 1824, 337, pl. 22; Zoöl. Journ., i, 1825, 133; Feruss. Bull. Sci. Nat., ii, 1824, 74.

Nyctinomus murinus, GRAY, MSS.—GRIFFITH, An. King., v, 1827, 66, No. 187.

Dysopes naso, WAGN., Suppl. Schreb., i, 1840, 475.

Nycticea cynocephala, LECONTE, Cuv. An. King. (McMurt. ed.), i, 1831, 442 (S. Car.).

Rhinopoma carolinensis, GUND., Arch. Naturg., 1840, 358, *nec* Geoff.—LECONTE, Proc. Phila. Acad., 1855, 437 (*not of* Geoffroy).

Molossus cynocephalus and *M. fuliginosus*, COOPER, Ann. Lyc. N. H., iv, 1837, 65, 67, pl. iii, figs. 1-4.—WAGN., Suppl. Schreb., v, 1855, 714.

Nyctinomus mexicanus, DE SAUSS., R. M. Z., xi, 1860, 283.

CHARS.—To the generic characters already given may be added: Fur thick, short, and soft, above dark fawn with whitish bases of the hairs, below delicate fawn with ashy bases. It is almost entirely confined to the body, but extends one-third way up the back of the ears, and forms an interbrachial patch on the wing-membrane. Length, $3\frac{1}{4}$ – $3\frac{3}{4}$; expanse, 10–11; tail alone, $1\frac{1}{4}$; fore-arm, $1\frac{2}{3}$; shin, $\frac{1}{2}$; longest finger, 3; ear, about $\frac{1}{2}$.

HAB.—Tropical and warm temperate America from the Southern United States to Chili and Buenos Ayres.

This is a widely distributed species, which, as seen by the above synonymy, has been redescribed under a variety of names, generic and specific, all of which, however, only refer to a single animal. In this country, it is ascertained to occur from South Carolina to Texas and in California. It also inhabits Mexico, the West Indies, Central America, and various parts of South America. Its peculiar physiognomy, only less singular than that of the Leaf-nosed Bat, renders it unmistakable.

FAM. VESPERTILIONIDÆ.

Ordinary Bats.

CHARS.—Rostrum unappendaged, *or* with lateral fleshy excrescences. Alar membranes ample. Tail completely inclosed in the femoral membrane, or only its last joint exerted.

The foregoing is a partial expression of the characters of our largest family of bats, to which all our remaining species belong; it readily distinguishes them collectively from either of the foregoing. The species of *Corynorhinus* is immediately recognized by the curious excrescences on the chaps and the big leafy ears; the other genera we adopt rest mainly upon dentition. In our generic arrangement, we differ somewhat from Dr. Allen, considering certain changes desirable; as we do also in the number of species we think proper to admit, being satisfied that a material reduction is necessary.

Analysis of North American VESPERTILIONIDÆ.

I. Cheeks excrescent; ears immense, etc.:

Genus CORYNORHINUS.

II. Cheeks simple:

a. Incisors, $\frac{1-1}{2-2}$ Genus ANTROZOUS.

b. Incisors,* $\frac{1-1}{3-3}$ Genus ATALAPHA —Molars, $\frac{4-4}{5-5}$.—Subg. *Nycticejus*.

Molars, $\frac{5-5}{6-6}$.—Subg. *Lasiurus*.

c. Incisors, $\frac{2-2}{3-3}$ Genus VESPERTILIO—Molars, $\frac{4-4}{5-5}$.—Subg. *Vesperus*.

Molars, $\frac{5-5}{5-5}$.—Subg. *Vesperugo*.

Molars, $\frac{5-5}{6-6}$.—Subg. *Vesperides*.†

Molars, $\frac{6-6}{6-6}$.—Subg. *Vespertilio*.

Genus CORYNORHINUS, Allen.

Synotus and *Plecotus* of some authors; not *Synotus* of KEYS. and BLAS., Wiegmann's Arch., 1839.

Corynorhinus, H. ALLEN, Proc. Acad. Phila., 1865, 173.

CHARS.—Teeth: I., $\frac{2-2}{3-3}$; C., $\frac{1-1}{1-1}$; P. and M., $\frac{5-5}{6-6} = \frac{16}{20} = 36$. Upper incisors separated at middle line, the centrals larger than laterals; both canines with minute

* Incisors of the *adult* dentition; the young are stated to have $\frac{2-2}{3-3}$

† Coues, new subgenus.

basal cusp; under incisors minutely serrate. Cheek with excrescence continuous with inner border of ear. Skull rather large; cranium inflated, with protuberant frontal portion. Rostrum depressed; no occipital crest. Ear very large, with exterior border extended as a semicircular flap as far as the tragus, which is well developed, half as high as ear, with well marked basal lobe. Differs from *Plecotus*, its European ally, in absence of a tongue-shaped appendage at base of inner border of ear.

CORYNORHINUS MACROTIS, (LEC.) Allen.

Big-eared Bat.

Plecotus macrotis, LECONTE, McMurtrie's Cuv., app., 1831, 431.

Synotus macrotis, ALLEN, Monog., 63.

Plecotus lecontii and *P. townsendii*, COOPER, Ann. Lyc. N. Y., 1837, iv, 72, 73.

Synotus lecontii and *S. townsendii*, WAGNER, Schreber's Säug., 1855, v, 720.

Synotus townsendii, ALLEN, Monog., 65.

Corynorhinus macrotis, ALLEN, Proc. Phila. Acad., 1865, 173.

CHARS.—Hair long, fine, and soft, extending moderately on the face; at base of ear, running up the inner border of ear as a delicate lipe, and sparsely out on back of foot; femoral membrane and base of thumb naked; nostrils almost lateral; lips thin, compressed. Head flat, not very broad; facial profile rising to level of nostrils. Fur above dark at base—almost blackish, at tips more brownish; below similar, but with grayish tips running to whitish toward the pubis. Total length, $3\frac{1}{3}$ – $3\frac{3}{4}$; expanse, 9–11; tail, $1\frac{2}{3}$; fore-arm, $1\frac{2}{3}$; shin, $\frac{2}{3}$; longest finger, $2\frac{1}{2}$ – $2\frac{2}{3}$; ear, 1 or more high.

HAB.—As restricted by Dr. Allen, this species is only known to occupy the Southern States, from the Carolinas to Mississippi, with a probability, as noted, of its occurrence northward to Meadville, Pa. (see Monog., 64, in text). But if, as we have no doubt, the *S. townsendii* of the author mentioned is the same species, the range includes the Upper Missouri region and the Great Basin, and doubtless extends across intermediate ground, as well as into New Mexico and Arizona.

Genus ANTROZOUS, Allen.

Antrozous, ALLEN, Proc. Phila. Acad., 1862, 247; Monog., 66.

CHAR.—Teeth: I., $\frac{1-1}{2-2}$; C., $\frac{1-1}{1-1}$; M., $\frac{4-4}{5-5} = \frac{12}{16} = 28$; thus unique in possession of only 4 under incisors (as in the family *Phyllostomatidae*). Upper incisors large, pointed, with median diastema; lower incisors trilobate, the middle ones in advance of the lateral pair; no small upper premolar; lower canine with strong salient acute basal cusp. Skull long, with greatly declining profile, but little or no frontal depression, crested behind. Snout tumid, blunt. Nostrils apical, their outer borders united above by a transverse line; eyes large; ears longer than head, separate. One known species.

ANTROZOUS PALLIDUS, (LeC.) Allen

The Pale Bat.

Vespertilio pallidus, LECONTE, Proc. Acad. Phila., 1855, 43.—BAIRD, Mex. B. Surv., ii, pt. ii, 1859, pl. 1, f. 1.

Antrozous pallidus, ALLEN, Monog., 68.—COUES, Am. Nat., 1867, 283.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
W	<i>Antrozous pallidus</i>	Pueblo, Colo	Oct., 1874	W. D. Wheeler.	
611 A	.....do	Apache, Ariz.	June 4, 1873	H. W. Henshaw.	

CHAR.—Ears ample, elliptical, with strongly convex inner border; outer border ending remote from angle of mouth; furred at base behind and slightly on both sides of inner border. Tragus half as high as auricle, lanceolate, nearly straight on anterior border, enlarged and crenulate posteriorly. A wart over the eye, under the jaw, and behind angle of mouth. Interfemoral membrane naked; base of thumb slightly hairy. Colors yellowish-brown or fawn, even pale reddish-brown. Naked muzzle livid. Nose to end of tail, $3\frac{1}{2}$ –4; expanse, $10\frac{1}{2}$ –12; tail, $1\frac{3}{4}$ –2; fore-arm, about 2; shin, $\frac{2}{3}$ – $\frac{4}{5}$; longest finger, 3– $3\frac{1}{3}$; ear, $\frac{3}{4}$ – $1\frac{1}{8}$.

HAB.—Originally described from “California.” The known range of this species has since been extended through Arizona and New Mexico to Texas; also, down the coast to Cape Saint Lucas and up to Oregon.

The only record of the habits of this peculiar bat of which we are aware is that given by Dr. Coues in the American Naturalist, as above quoted, he having observed it during his stay at Fort Yuma in 1865: “This species is very abundant at Fort Yuma, where, during the hot months, it becomes a decided nuisance. Numbers take up their abode in the chinks and crannies of the officers’ quarters; and the proximity of these retreats actually becomes offensive from the multitudes crowded together. During the daytime, a continual scratching and squeaking, as of so many mice, is heard in their snuggeries; and, at night, they are even more annoying, fluttering by scores about the rooms. They are accused of harboring bed-bugs about their bodies, whether justly or not I cannot say. When caught or disabled, they have a harsh squeak, and, if incautiously handled, bite with vigor and considerable effect. This bat, as its name indicates, is much lighter in color

than most of our species; and it has also a peculiar physiognomy, more repulsive and forbidding than is usual even in this family, none of the members of which have remarkably prepossessing features."

Genus ATALAPHA, Rafinesque.

Atalapha, *Nycticejus*, *Lasiurus*, RAFINESQUE.

Nycticejus et *Lasiurus*, ALLEN, Monog., 11, 14.

CHAR.—Adult dentition: I., $\frac{1-1}{3-3}$; C., $\frac{1-1}{1-1}$; M., $\frac{4-4}{5-5}$ (subg. *Nycticejus*) or $\frac{5-5}{5-5}$ (subg. *Lasiurus*) = 30 or 32 teeth. The variable tooth is the anterior premolar, absent in *Nycticejus*, present in *Lasiurus*, but minute and liable to be overlooked, hidden as it is by approximation of the next premolar to the canine.

By the foregoing expression, we wish to indicate and limit a group of bats agreeing in the lack, when adult, of median upper incisors, and thus differing from all the succeeding species we unite under *Vespertilio*. Their only dental discrepancy is the slight one mentioned, which may be held to constitute a subgenus. The several species here united (referred by Allen to the two genera *Lasiurus* and *Nycticejus*) differ considerably among themselves in the depression, massiveness, and other proportions of the skull, and consequently in their physiognomy, as well as in the degree of hairiness or nakedness of femoral membrane; but, as they are variously interrelated in these points, which, moreover, are not strictly correspondent with dentition, it becomes difficult, if not impossible, to draw a generic line between them. Among Rafinesque's names, we adopt *Atalapha*, which, he says, contains "bats without fore teeth" (*i. e.*, lacking the middle upper incisors)—an expression, it is true, not accurate, but still intelligible; and, in the case of this writer's work, we have generally to choose between inaccuracy and unintelligibility, excepting when what he says is *both* erroneous and enigmatical.

NOTE.—The "*Lasiurus*" *intermedius* of ALLEN, Proc. Phila. Acad., 1862, 146, and Monog., 25, from Matamoras, Mex., will doubtless be found within our limits. It appears to be perfectly distinct from any of the species here described, and to form a connecting link between some of the subgeneric, if not generic, groups. "In size, physiognomy, number of incisors, and character of the distribution of the fur, it resembles the type of *Lasiurus*; while, in shape of the ears and disposition of the molars, it is akin to" the *Vesperus* section of *Vespertilio*. But has not Dr. Allen overlooked the fact that its molar dentition ($\frac{4}{5}$) also corresponds with *Nycticejus*, with which we believe, judging solely from the description, it must be placed, as ATALAPHA (NYCTICEJUS) INTERMEDIUS?

ATALAPHA (NYCTICEJUS) CREPUSCULARIS, (LeC.) Coues.

Twilight Bat.

Vespertilio crepuscularis, LeCONTE, McMurtrie's Cuv., i, 1831, 432, and Proc. Phila. Acad., vii, 1855, 433.

Nycticejus crepuscularis, ALLEN, Monog., 12.

Vespertilio creeks, F. CUV., Nouv. Ann. Mus., i, 1832, 18.

CHAR.—Teeth only 30 in all (molars, $\frac{4}{5}$); upper incisors small, slightly convergent, close to canines, which are large, simple; front molar longer and slenderer than the rest. Skull not so flat as in *Vesperus* and *Vesperugo*, yet not so inflated as in *Lasiurus*; longer and more pointed than in *Lasiurus*. Head short, broad, flat; ears small, simple, widely separated; internal border at base strongly curved, outer rather inconspicuous; tragus straight on inner, convex on outer border. Nostrils simple, not produced, very little emarginate. Cheeks tumid. A rather large naked chin space. Eyes small, with a wart above on either side; another between ear and angle of mouth. Interfemoral membrane not hairy, triangular, moderately ample; calcaneal spur slight; tip of tail exserted. Membranes blackish-brown; face black. Fur rather scanty, woolly; excepting a small patch at base of the interfemoral, the membranes are naked both sides. Back lower third of ear hairy. Hairs on upper parts dark fawn for upper half, lower half lighter, bordering on brown; color of the lower parts lighter and more uniform, very plumbeous at base, light brown at tips of the hairs. General expression of species of *Vesperus* and *Vesperugo*, but the naked parts blackish. Length to end of tail, $3\frac{1}{4}$; expanse, $7\frac{1}{2}$ – $9\frac{1}{2}$; tail, $1\frac{1}{3}$; arm, $1\frac{1}{3}$; shin, $\frac{1}{2}$; longest finger, $2\frac{1}{4}$ – $2\frac{3}{4}$; ear under $\frac{1}{2}$.

HAB.—Has been observed from Pennsylvania and Missouri to Georgia and Texas, and doubtless also occurs in New Mexico.

ATALAPHA (LASIURUS) NOVEBORACENSIS, (Exrl.) Coues.

The Red Bat; New York Bat.

Vespertilio noveboracensis, ERXLEBEN, Syst. Anim., 1777, 135.—HARLAN, Fn. Am., 1825, 20.—GODMAN, Am. Nat. Hist., i, 1831, 68, pl. —, f. 1, 2.—COOPER, Ann. Lyc. N. Y., 1837, 57.—DEKAY, Nat. Hist. N. Y., 1842, 6, pl. ii.—LeCONTE, Proc. Phila. Acad., 1855, 432.

Nycticejus noveboracensis, LEC., McMurtrie's Cuv., 1831, 432.

Lasiurus noveboracensis, TOMES, Proc. Zool. Soc., 1857, 34.—ALLEN, Monog., 16.

Vespertilio lasiurus, GMELIN, S. N., 1788, 50.

Nycticejus lasiurus, WAGNER, Suppl., Schreb. v, 1855, 772.

Vespertilio rubellus, BEAUVOIS, Cat. Peale's Mus., 1796.

Vespertilio villosissimus, GEOFFROY, Ann. Mus., viii, 1806, 478.

Vespertilio monachus and *tesselatus*, RAFINESQUE, Am. Month. Mag., iv, 1817, 445.

Taphyzous rufus, HARLAN, Fn. Am., 1825, 23.

Vespertilio rufus, WARDEN, Descr. U. S., v, 602.

Lasiurus rufus, GRAY, List Mamm. Br. Mus., 1843, 32.—GOSSE, Nat. in Jam., 1851, 280.

Vespertilio blossevillii, LESS. et GARN., Bull. Sc. Nat., viii, 95.

Vespertilio bonariensis, LESS., Voy. Coq., 1829, p. —.

Nycticejus varius, POEPPIG, Reise Chili, i, 1835, 451.

Red Bat, WILSON.

New York Bat, PENNANT.

CHAR.—Teeth, 32 (molars, $\frac{5}{8}$); anterior upper premolar minute, hidden from view externally, being wedged in between the next premolar and canine; upper incisors small, strongly convergent; lower ones crowded; lower canines pointing backward; front and next under premolars distinct. Skull small, with broad cranial and high occipital regions. Tail entirely included in femoral membrane. Head and face hairy; nose blunt, rounded, slightly emarginate, with semilateral nostrils. Ears subcircular; inner border straight to near the top, where suddenly curved, its base with a strong lobe close to but behind the tragus; outer border with a sharp lobe reaching angle of mouth; a small, bristly wart interposed; tragus half as high as auricle, straight on inner border, but end obtuse and abruptly turned; back surface of auricle furred half way up. Wings extensively furry here and there—the general fur extending upon the membranes on either side to the base of the third finger; a sparse growth on the interbrachial portion; a conspicuous white or whitish tuft at the shoulder; a scattering growth on the back of the fifth finger for about a third of its length, sometimes extending between the fourth and fifth fingers; and a whitish tuft at the base of the thumb. Upper surface of femoral membrane completely and densely furry, like the back; under surface of same furred about half way out from the pubis. Fur everywhere long and silky; each hair at base dark plumbeous, verging to black, then yellowish-brown, passing into a darker or a brighter reddish, or even chocolate, generally white at the tip. Lips and ears *not* edged with black. Length about $3\frac{3}{4}$, of which tail is $1\frac{3}{4}$ –2; extent, $10\frac{1}{2}$ –12; arm, $1\frac{2}{3}$; ship, $\frac{3}{4}$; longest finger, $3\frac{1}{3}$; ear, $\frac{1}{3}$ – $\frac{1}{2}$ high.

HAB.—Abundantly and universally distributed throughout the temperate portions of North America.

This pretty species will be immediately recognized from any excepting the next by its “redness”, together with the dense furriness of the top of the leg-membrane and extensive patches of fur on the wings. Specimens, however, vary much in color, as has been noted by Dr. Allen, and more completely described by Mr. Allen, who has found that some sexual distinctions are usually pronounced. “In some specimens, the terminal band (on individual hairs) of whitish is quite absent, particularly on the anterior part of the body; the subterminal bright red zone being thus continuous to the tips of the hairs. In other specimens, the terminal band of white is developed to a great degree, so as to very much obscure the red or dark chocolate zone beneath. Such specimens strongly approximate to what is called the Hoary Bat, where the terminal white zone reaches its maximum of development, and the subterminal russet zone its greatest intensity. In

a series of about twenty Massachusetts skins, all the males are of a beautiful bright yellowish-red, with scarcely a trace of the apical white; the females, though somewhat more variable, are darker, the light red of the males being replaced in these by dark russet, which is more or less obscured by the whitish tips." The same author continues respecting other points:

"Very little appears to be known respecting the time of copulation or period of gestation of the bats. From Mr. J. G. Shute, of Woburn, Mass., I learn a fact in reference to this point. Soon after sunset one evening in October, he observed a strange object pass him in the air, which seemed to fall to the ground not far from where he was standing. Repairing immediately to the spot, he soon found it, which proved to be a pair of these bats *in coitu*. They were captured and thrown into alcohol, and thus forwarded to the Museum of Comparative Zoölogy." Aërial venery is doubtless practiced by other species, as it is by some birds, like the well-known Chimney Swift for instance.

In most portions of the United States, the Red Bat is one of the most abundant, characteristic, and familiar species, being rivaled in these respects by the Little Brown Bat alone. It would be safe to say that, in any given instance of a bat entering our rooms in the evening, the chances are a hundred to one of its being either one or the other of these two species. The perfect noiselessness and swiftness of its flight, the extraordinary agility with which it evades obstacles—even the most dexterous strokes designed for its capture—and the unwonted shape, associated in popular superstition with the demons of the shades, conspire to revulsive feelings that need little fancy to render weird and uncanny. But the bat is no ghost; on the contrary, a substantial, compact little creature of flesh and blood, much like a mouse with wings, completely animal to the tips of its ears and tail; an erratic yet busy little hunter for insects, out on the fly after bugs, attracted to our apartments not by the light as some suppose, but simply in pursuit of its prey, which is attracted by the light. When captured, which may not be until far on in a breathless attack with brooms, tongs, and hats, during which the furniture is upset and the lamp perhaps put out, the little animal will be found a reddish, furry, flat creature, with membranes of exquisite delicacy, folded on each side like half of a tiny umbrella, of

which the tremendous long fingers are the sticks; humpy about the shoulders, sloping down to a furry expanse behind, with a piggish little head, twisting all ways at once, on a stumpy neck; mouse-like ears, standing straight up; funny, little, snapping, black specks of eyes; and an "open" countenance indeed—for the mouth is deep, bristling with fine needle-like teeth, while from the throat comes a sharp squeaky barking of anger and perhaps defiance, if we can suppose such a pigmy to have so great a soul. Such is the simple creature that excites emotional persons to fancies not wholly lacking an element of terror; and the utmost damage it could do the clumsy giants, its captors, would be a prick from its tiny teeth—pretty sure to be given to an incautious finger-tip.

An anecdote illustrating a tender trait of this animal has been related by Mr. Titian Peale. A person had caught and taken home a young Red Bat. "Three hours afterward, in the evening, as he was conveying it to the museum, in his hand, while passing near the place it was caught, the mother made her appearance and followed the boy for two squares, flying around him, and finally alighted on his breast, such was her anxiety to save her offspring. This faithful creature lived two days in the museum, and then died of injuries received from her captor. The young one, being but half grown, was still too young to take care of itself, and died shortly after."

ATALAPHA (LASIURUS) CINEREUS, (Beauv.) Coues.

The Hoary Bat.

Vespertilio cinereus, PALISOT DE BEAUVOIS, Cat. Peale's Phila. Mus., 1796, 14.—LECONTE, Proc. Phila. Acad., 1855, 433.

Lasiurus cinereus, H. ALLEN, Monog., 21.—J. A. ALLEN, Bull. Mus. Comp. Zoöl., ii, 208.

Vespertilio pruinus, SAY, Long's Exp. R. Mts., 1823, 67.—HARL., Fn. Am., 1825, 21; Med. & Phys. Res., 1831, 28.—GODM., Am. Nat. Hist., i, 1831, 68, pl. 2, f. 3.—RICH., F. B.-A., i, 1829, 1.—COOP., Ann. Lyc. N. Y., iv, 1837, 54.—DEKAY, N. Y. Fn., i, 1842, 7, pl. 2, f. 2.

Scotophilus pruinus, GRAY, Mag. Zoöl. Bot., ii, 1838, 498.

Nycticejus pruinus, TEMM., Mon. Mamm., 1835, 154.—WAGN., Suppl. Schreb., i, 1840, 544; v, 1855, 770.

Lasiurus pruinus, TOMES, P. Z. S., 1857, 37.

CHARS.—Dentition and other structural characters precisely as in the last species. Size averaging larger; length, 4–5½ inches; tail alone, 2–2½; extent, 10–15, but usually

12-14; arm, 2; longest finger, $3\frac{3}{4}$ -4 $\frac{1}{2}$; ear, $\frac{1}{2}$ - $\frac{1}{2}$. Lips and ears marked with black; body colors rich chocolate brown, or smoky fawn color, overlaid with white, giving a brilliant "hoary" appearance.

HAB.—North America at large.

Some reasonable doubt has been expressed respecting the specific distinctness of this species and the last; but further comparison will be required to prove it only a variety. Though very generally distributed, it appears to prefer higher latitudes and more elevated regions, and is the only bat known to occur in the northern regions visited by Kennicott. We have, however, been favored with a specimen from the southern deserts of Arizona, where it was taken by Lieut. C. Bendire, U. S. A. It is comparatively rare. Dr. Allen writes us that he has only seen some twenty or thirty specimens in all.

Two specimens were secured in Thistle Valley, Eastern Utah, by the expedition of 1872.

This species, since Mr. Say described it, in Long's Report of Expedition to Rocky Mountains, has generally been known under the name of *V. pruinus*; but Major LeConte corrected the error, and ascribed to Palisot de Beauvois the prior name of *V. cinereus*, to which it was entitled. Dr. Allen assents to the determination.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
A 4	<i>L. cinereus</i>	Thistle Valley, Utah ..	Aug., 1872	H. W. Henshaw..	.
A 4 a	.....do .....	.....do .....	.....do .....	.....do	

Genus **VESPERTILIO**, (L.) Auct.

Vespertilio, L., of AUTHORS.

Scotophilus, LEACH, Trans. Linn. Soc., xiii, 1822, 71.—ALLEN, Monog., 27.

Vesperus, KEYS. & BLAS., Wirb. Eur., 1840, 49.

Vesperugo, *Iid.*, *ibid.*, 45.

Vesperides, COUES, *antea*.

CHARS.—Incisors, $\frac{4}{6}$; molars, $\frac{4-4}{5-5}$ or $\frac{5-5}{5-5}$ or $\frac{5-5}{6-6}$ or $\frac{6-6}{6-6}$; teeth, in all, 32, 34, 36, or 38.

This dental formula sufficiently indicates a generic section that may, without violence, include all the remaining species of North American Bats.

They are collectively distinguished from any of the foregoing *Vespertilionidae* by the presence of four instead of two upper incisors. They fall in four sub-genera, according to peculiarities of the molar dentition. The single species of *Vesperus* has molars $\frac{4-4}{5-5}$, 32 teeth in all. The two or three species of *Vesperugo* have molars $\frac{5-5}{5-5}$, 34 teeth in all. The species of *Vesperides* has $\frac{5-5}{6-6}$. The several species of true *Vespertilio* have molars $\frac{6-6}{6-6}$, 38 teeth in all. The species of *Vesperus* and *Vesperugo* are more nearly related to each other than they are to those of typical *Vespertilio*, and are often together separated generically from the last named; but, as Dr. Allen has observed, in so separating them the differences are difficult to describe. *Vesperus* and *Vesperugo* have heavier wing-membranes, and thicker, more leathery, ears, developing in width rather than in height: *Vespertilio* contains more delicately organized species, with thin wings and ears. "The difference in their facial expression might be compared to that between a mastiff and a terrier dog: the former is massive, with broad head, pendulous lips, and wide ears; the latter is more slender, with a narrower face, and delicate and upright ears." The skull in *Vespertilio* is lighter, with narrower rostrum, more concave frontal outline, and more inflated cranial part.

VESPERTILIO (VESPERUS) FUSCUS, Beauv.

Carolina Brown Bat.

Vespertilio fuscus, PALISOT DE BEAUVOIS, Cat. Peale's Mus., 1796, 14.—LECONTE, Proc. Phila. Acad., 1855, 434.

Scotophilus fuscus, ALLEN, Monog., 31.

Vespertilio carolinensis, GEOFFROY ST. HILAIRE, Ann. du Mus., 1806, viii, 193, pl. xlvii, f. 7.—HARL., Fn. Am., 1825, 9.—GODM., Am. Nat. Hist., i, 1831, 67.—LEC., McMurt. Cuv., i, 1831, 431.—COOP., Ann. Lyc. N. Y., iv, 1837, 60.—DEKAY, N. Y. Fn., i, 1842, 10, pl. 2, f. 1.—DESM., Mamm., i, 1820, 136.—TEMM., Mon., ii, 1835, 237.—LEC., Proc. Acad. Nat. Sci. Phila., 1855, 434.—WAGN., Suppl. Schreb., v, 1855, 753.—WOODH., Sitgr. Rep. Zuñi and Col. Riv., 1854, p. 43.

Scotophilus carolinensis, ALLEN, Monog., 28.

Vespertilio arcuatus, SAY, Long's Exped., 1823, 167.

Vespertilio phaiops and ? *Eptesicus melanops*, RAFINESQUE, Am. Month. Mag., 1818, 445 (nec Temm.).—LEC., Proc. Acad. Nat. Sci. Phila., 1855, 434.—WAGN., Suppl. Schreb., 1855, 756.

Vespertilio ursinus, TEMM., Mon. Mamm., ii, 1835, 235.—WAGN., Suppl. Schreb., v, 1855, 756.—LECONTE, Proc. Acad. Nat. Sci. Phila., 1855, 434.

? *Vespertilio gryphus*, FR. CUV., Ann. Mus., i, 1837, 15.—WAGN., Suppl. Schreb., v, 1855, 749.

Vespertilio caroli, LECONTE (*nec* Temm.), Proc. Acad. Nat. Sci. Phila., 1855, 435.

CHARS.—Molars, $\frac{4-4}{5-5}$; the front upper one narrower than the rest, corresponding to the third one (last premolar) of *Vespertilio* proper; the two front lower ones smaller than the other three. Incisors, $\frac{2-2}{3-3}$; the lateral upper pair much smaller than the central pair. Base of foot with a rounded swelling. Tip of tail exerted. Wing-membrane reaching base of toes. No extension of fur on the wing-membranes; leg-membrane triangular, furred at basal fifth on upper side, elsewhere more or less perfectly naked. Ears moderate, leathery, furred $\frac{1}{3}$ – $\frac{1}{2}$ way up the back, turned more or less outward, with convex inner and straight or slightly emarginate outer border, and well-developed basal lobe; tragus nearly half as high as auricle, tip never pointed, outer border notched near the base. Nostrils emarginate; head flat. Hairs dark plumbeous, or dark cinereous on the basal part, a variable shade of brown at the ends, usually lighter on the under surface of the body than on the upper. Length, 3–4; tail, alone, $1\frac{1}{3}$ – $1\frac{1}{2}$; extent, 10–12; longest finger, $2\frac{2}{3}$ –3; arm, $1\frac{1}{2}$ –2; shin, $\frac{3}{4}$ – $\frac{3}{4}$; ear, about $\frac{1}{2}$ high.

HAB.—United States.

Dr. Allen has noted three different styles of coloration in this species. In one, the ends of the hairs are chestnut-brown above, grayish-white below; in another, olive-brown above, fawn-russet and whitish below; in a third, deep chestnut above, and scarcely lighter below; while occasionally the whole fur shows white tips (much as in case of *A. cinerea*). The same author expresses the hesitation he felt in separating *V. fuscus* and *carolinensis*, in reuniting which we have none, thus indorsing Mr. J. A. Allen's view.

This species, the dentition of which prevents confusion with any other, has been reported from various and widely-separated localities all over the United States. Mr. Allen says it is "common" in Massachusetts.

Several specimens were collected in Arizona in 1873.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
49	<i>V. fuscus</i>	Rio Grande, Colo.	June, 1873	H. W. Henshaw ..	
49 a	.....do .....	.....do .....	.....do .....	.....do	
658	.....do	Apache, Ariz	Aug. 9, 1873	Dr. O. Loew	
611	.....do .....	.....do	Aug. 24, 1873	H. W. Henshaw ..	

NOTE.—Specimen 658 has the membrane much more transparent than the others.

VESPERTILIO (VESPERUGO) GEORGIANUS, F. Cuv.

Georgian Bat.

Vespertilio georgianus, F. CUV., Ann. Mus., 1832, 16.—LEC., Proc. Acad. Nat. Sci. Phila., 1855, 436.—WAGN., Suppl. Schreb., i, 1855, 750.

Scotophilus georgianus, ALLEN, Monog., 35.

? *Vespertilio monticola*, BACHMAN, Proc. Acad. Nat. Sci. Phila., 1841, 92.

CHARS.—Molars, $\frac{5-5}{5-5}$; 34 teeth in all. Upper incisors all of about equal size, the central pair bicuspid. Skull small, papery, not so flat as in the species of *Vesperus*. Base of foot without rounded swelling of *Vesperus*. Tragus slender, erect, half as high as auricle. Ear nearly naked, subelliptical, slightly convex on the inner, nearly straight on the outer, border, which terminates near the mouth in a wart. Nose flat, broad, naked; nostrils small, oblique, sublateral. Point of tail exserted; femoral membrane on dorsal surface furred about one-third, on ventral surface with numerous small tufts of fur arranged transversely. Wing-membranes reaching base of toes, furred a little distance from the body on the anterior surface. Base of fur everywhere dark plumbeous; end on upper parts dark rufous brown, on lower parts brighter. Small; length about 3 inches; tail, $1\frac{1}{2}$; extent, $8\frac{1}{2}$ – $9\frac{1}{4}$; arm, $1\frac{1}{4}$ – $1\frac{1}{3}$; shin, $\frac{1}{2}$; longest finger, $2\frac{1}{3}$; ear, $\frac{1}{3}$ – $\frac{1}{2}$.

HAB.—Maine and Missouri to Texas.

This species is readily distinguished from its subgeneric allies by the slender erect tragus and very partially furred femoral membrane as compared with *V. noctivagans*; and bicuspid central incisors as compared with *S. hesperus*. The physiognomy rather approaches that peculiar to *Vespertilio* proper. The original imperfect diagnosis of "*V. georgianus*" has been shown by LeConte and Dr. Allen to be applicable here. The species is apparently most frequent in the Middle and Southern States, but has been reported from the northern and western points above mentioned.

VESPERTILIO (VESPERUGO) HESPERUS, (Allen) Coes.

The Western Bat.

SYN.—*Scotophilus hesperus*, ALLEN, Monog., 43.

CHARS.—Molars, $\frac{5-5}{5-5}$; 34 teeth in all; dentition as in *V. georgianus*, but central upper incisors unicuspid. Skull flat and broad. Base of foot without rounded swelling of *Vesperus*. Tragus short, blunt, curved hardly or not half as high as auricle. Point of tail not exserted. Interfemoral membrane ample, with a small calcaneal lobe, its dorsal surface only very partially furred, as in *V. georgianus*. Head small, flat; face blunt, not hairy; body rather slender; size diminutive; length, $2\frac{1}{3}$ – $2\frac{3}{4}$; extent, 7; tail, 1; arm, 1 – $1\frac{1}{3}$; finger, $1\frac{1}{2}$ –2; shin, $\frac{1}{3}$; thumb, $\frac{1}{16}$; ear, $\frac{1}{3}$. Color above obscure dirty gray, with more or less brownish; below lighter; fur except at tip dark plumbeous.

HAB.—Southern California.

This species, apparently quite distinct, is only known by Dr. Allen's description. It is stated to resemble *V. pipistrellus* of Europe in general external characters, but to differ in color, corresponding in some respects, as of size and shape of ear, with *V. alcythoë* and *V. aristippe* of Europe; it differs from these in having one more upper molar.

VESPERTILIO (VESPERIDES) NOCTIVAGANS LeC.

Silver-Black Bat.

Vespertilio noctivagans, LECONTE, McMurtrie's Cuv., i, 1831, 31.—COOPER, Ann. Lyc. N. Y., iv, 1837, 59.—DEKAY, Nat. Hist. N. Y., 1842, 9, pl. 1, f. 1.—WAGN., Suppl. Schreb., v, 1855, 754.

Scotophilus noctivagans,—ALLEN, Monog., 39.—J. A. ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874.

Vespertilio auduboni, HARLAN, Month. Am. Journ., i, 1831, 220, pl. 2; Med. & Phys. Res., 1835, 30, pl. 4.

Vespertilio pulverulentus, TEMM., Mon. Mamm., ii, 1835, 235.—LECONTE, Proc. Phila. Acad., 1855, 435.—MAXIM., Arch. Naturg., 1861, 192.

CHARS.—Molars, $\frac{5-5}{6-6}$; teeth 36 in all (only species with this total); central upper incisors bicuspid. Skull flat, not crested; two shallow depressions anteriorly. Base of foot without the rounded lateral swelling of *Vesperus*. Tragus very short, broad, and blunt, angularly convex along outer border, hardly or not $\frac{1}{3}$ as high as auricle. Ear irregularly oval; inner border running upward and inward to level of head, then upward and outward, ending obtusely. Outer border below folded irregularly, bending inward so as to touch the tragus. Snout naked; nostrils wide apart, opening sublaterally; space between emarginate. Femoral membrane entirely, though scantily, furry on dorsal surface, with numerous minute tufts arranged linearly on ventral surface. Thumb small, slightly furry. Fur long and silky, black, or nearly so; the ends of the hairs usually white or whitish, giving a peculiar powdery aspect; sometimes entirely black. Length, 3; extent, 12; tail, $1\frac{1}{4}$ – $1\frac{1}{2}$; shin, $\frac{1}{2}$; arm, $1\frac{1}{2}$; longest finger, $2\frac{3}{4}$; thumb, $\frac{1}{4}$ – $\frac{1}{3}$; ear, $\frac{1}{2}$; tragus, about $\frac{1}{6}$.

HAB.—North America.

The peculiar dentition and the remarkable coloration will prevent any misconception respecting this bat, which is said to be nearly related to *V. discolor*, a European species. Although Dr. Allen gives its habitat as Atlantic coast to the Rocky Mountains, yet he quotes Pacific-coast specimens, and it seems to be no exception to the general rule in the family of general and extensive dispersion. Mr. J. A. Allen gives it as rather common in Massachusetts.

VESPERTILIO SUBULATUS, Say.

Little Brown Bat.

Vespertilio subulatus, SAY, Long's Exp. R. Mts., 1823, 65.—HARLAN, Fn. Am., 1825, 22.—RICHARDSON, F. B.-A., i, 1829, 3.—GODMAN, Am. Nat. Hist., i, 1831, 71.—COOPER, Ann. Lye. N. Y., 1837, iv, 61.—DEKAY, Nat. Hist. N. Y., 1842, 8.—LECONTE, Proc. Phila. Acad., 1855, 436.—H. ALLEN, Monog., 51.—J. A. ALLEN, Bull. Mus. Comp. Zoöl., i, 210.—*Id.*, Proc. Bost. Soc. Nat. Hist., xvii, June, 1874, p. —.

Vespertilio caroli, TEMM., Monog., ii, 1835, 236.

Vespertilio domesticus, GREENE, Cab. Nat. Hist., ii, 290.

? *Vespertilio salarii*, *crassus*, and *subflavus*, F. CUV., Ann. du Musée, i, 1832, 16, 17, 18 (may be *V. georgianus*).

? *Vespertilio virginianus*, *californicus*, and *leibii*, AUD. & BACH., Journ. Phila. Acad., 1842, viii, 282, 284, 285.

? *Vespertilio lucifugus*, LECONTE, McMurtrie's Cuv., 1831, 431.—*Id.*, Proc. Phila. Acad., 1855, 436.—ALLEN, Monog., 55.

? *Vespertilio brevirostris*, MAXIM., Verz. Säug. Nord-Am., 1860, 19 (robust var. with short ears and blunt nose).

? *Vespertilio nitidus*, ALLEN, Proc. Phila. Acad., 1862, 247.—*Id.*, Monog., 60 (U. S. west of R. Mts.).

? *Vespertilio evotis*, ALLEN, Monog., 48 (slender form, with longest ears and most-pointed snout).

? *Vespertilio yumanensis*, ALLEN, Monog., 58, and Proc. Phila. Acad., 1866, 283 (four specimens only).

? *Vespertilio affinis*, ALLEN, Monog., 53 (one specimen, Arkansas).

? *Vespertilio macropus*, ALLEN, Proc. Phila. Acad., 1866, 288 (one specimen, California).

? Compare also *Vespertilio obscurus*, *volans*, *exilis*, and *tenuidorsalis*, ALLEN, Proc. Phila. Acad., 1866, 281, 282, 283, all from Cape Saint Lucas.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
75 a a	<i>V. subulatus</i>	White Mts., Arizona ..	Aug., 1873	H. W. Henshaw ..	
B 19, 1	.....do	Southern Arizona	Sept., 1873	.....do	
B 20	.....do .....	.....do .....	.....do .....	.....do	
B 21	.....do .....	.....do .....	.....do .....	.....do	
75 a	<i>V. "lucifugus"</i>	White Mts., Arizona...	Aug., 1873	.....do	
B 19	<i>V. "nitidus"</i>	Southern Arizona	Sept., 1873	.....do	
B 19, 2	.....do .....	.....do .....	.....do .....	.....do	
B 19, 3	.....do .....	.....do .....	.....do .....	.....do	

CHARS.—Molars, $\frac{6-6}{6-6}$; teeth 38 in all. Upper incisors paired off, close to canines, a median space intervening; the middle pair markedly bifid, the lateral ones obscurely

or not so; lower canines with small basal cusp posteriorly; first two upper premolars small, especially the second one, the last one larger, compressed, and bicuspid, the large outer cusp longer than any point of the true molars; lower premolars small, especially the two front ones. Skull thin and papery, crestless, with inflated cranial, and narrow, prolonged rostral part, giving a small face, high forehead, rather pointed muzzle, and foxy or terrier-like physiognomy. Face moderately whiskered. Ears rather large, oval in general contour, but with variously modified details of slightly sinuous border, and blunt tip. Tragus about half as high as auricle, upright, or nearly so, lanceolate, with nearly straight anterior, and moderately divergent posterior, border, at base of which last is a small nick and lobe, variously shaped. Extreme tip of tail more or less obviously exserted. Interfemoral membrane naked on dorsal surface, except a triangular patch of fur at its base, continuous with covering of the back. Wing-membranes naked, very delicate, thin, almost diaphanous, usually rather brown than blackish. Fur dark plumbeous at base, at tip a varying shade of brown, from quite dark to yellowish-brown, usually palest on the belly. General build delicate; size small. Total length, about 3 inches, often less; expanse up to 10, oftener 8-9; tail about $1\frac{1}{2}$; fore-arm about equal to tail; longest finger, $2-2\frac{1}{2}$; ear usually $\frac{2}{3}$, but from $\frac{1}{2}$ to $\frac{3}{4}$.

HAB.—North America at large.

It is impossible for us to believe that more than a single species of bat is included in the above extensive synonymy. Of this, the first sentence of the above paragraph is diagnostic; the rest, fairly descriptive. We will state, before proceeding further, that we are autoptically familiar with little more than the ordinary forms of *V. subulatus*, but that our experience with these is ample, and it tallies precisely with what we have learned in a protracted critical study of various other families of our mammals. For this reason, if for no other, we must not be considered presumptuous in so summarily criticising adversely the labors of one who has made the bats a speciality. But, furthermore, it is notorious that one looking afresh at the general bearings of a subject may discern what another more practiced, yet, so to speak, pre-occupied, eye, has failed to discover. Almost throughout his monograph, Dr. Allen has given diagnoses and descriptions perfectly tangible and satisfactory; but, in this case of the 38-toothed bats, we cannot find, on sifting out his accounts, anything to rest upon. He is perfectly right, we think, in rejecting the nominal species of earlier writers. From what little can be made of them, they seem mostly referable to *V. subulatus*; the remainder of those not identifiable oscillating between this species and *V. georgianus*, which might be superficially described in almost identical terms. But, after this, has he not fallen into precisely the same

erroneous method of study? His descriptions differ in tone from those of his predecessors most decidedly; being rigidly exact, and therefore faithful reflections of certain observed peculiarities, they are, without exception, identifiable. But we are satisfied that he has described *specimens only*—not species—in his monograph; and his discriminations have been pushed to a still more unwarrantable extreme in his subsequent paper (Proceedings of the Philadelphia Academy, 1866, 280 *et seq.*). Of our own positive knowledge, acquired by original investigation, we can affirm, without fear of valid contradiction, that all the characters upon which the $\frac{6}{8}$ - $\frac{6}{8}$ -molared bats he proposes or adopts rest, come fairly within range of individual variation. These characters are without exception comparative, not positive. They are: details of size and contour of the ear and its tragus; amount of exsertion of the point of the tail; extent of attachment of wing-membrane to foot; and shade of color. We have here nothing to rest upon. At first we were inclined to believe there might be a geographical variety at least, *V. "nitidus"* constituting the Pacific form; but we took typical *subulatus* in Arizona (as determined by Dr. Allen, himself, *loc. cit.*, 288), and specimens from the East will answer the description of *nitidus*. Besides, nearly all that we know of the distribution of our bats is against a supposition of such geographical limitation. We are convinced that Mr. J. A. Allen has struck at the root of the matter in his criticism (*loc. cit.*). We entirely agree with what seems to us to be his timely and judicious review of the case, viz: that there is but one species; that there are no geographically limited varieties; that there may be recognized two "varieties" of ordinary *subulatus*, one—*evotis*—slender, with largest ears and most pointed snout; the other—*lucifugus*—stout, with smallest ears and bluntest snout; both shading imperceptibly into the usual form. They are all, he adds, sometimes found clinging together in the same "festoons".

The little Brown Bat and the Red Bat are the two species by far the most abundant throughout this country. Of the present species as many as ten thousand, by actual count, have been destroyed in one building alone

NOTE.—In concluding an account of the *Chiroptera*, it is proper to state that our article is, to some extent, based upon Dr. Allen's memoir; from which many of the descriptive phrases have been compiled, and much of the synonymy directly borrowed.

RODENTIA.

FAM. ZAPODIDÆ.

Genus ZAPUS, Coues MSS.

ZAPUS HUDSONIUS, (Zimm.) C. & G.

Jumping Mouse.

- Dipus hudsonius*, ZIMM., Geog. Gesch., ii, 1780, 35.—BODD., Elench. An., 1784, 115.—FISCH., Syn., 1829, 340.
- Meriones hudsonius*, AUD. & BACH., Q. N. A., ii, 1851, 251, pl. 85.
- Jaculus hudsonius*, BD., M. N. A., 1857, 430, and of most late authors.
- Zapus hudsonius*, COUES MSS., 1875.
- Mus longipes*, ZIMM., Penn. Arkt. Zoöl., i, 1787, 131.
- Dipus canadensis*, DAV., Linn. Tr., iv, 1798, 155.—SHAW, Gen. Zoöl., ii, 1801, 192, pl. 161.
- Gerbillus canadensis*, DESM., Mamm., ii, 1822, 321.—HARL., Fn. Am., 1825, 155.—GRIFF., An. Kingd., v, 1827, 240.—GODM., Am. Nat. Hist., ii, 1831, 94.
- Dipus americanus*, BARTON, Am. Phil. Trans., iv, 1799, 115; vi, 1809, 143.
- Jaculus americanus*, WAGL., Syst., 1830, 23.
- Meriones americanus*, DEKAY, N. Y. Zoöl., i, 1842, 70, pl. 24, f. 2.
- Mus labradorius*, J. SAB., Frankl. Journ., 1823, 661.
- Gerbillus labradorius*, HARL., Fn. Am., 1825, 157.—GODM., Am. Nat. Hist., ii, 1831, 97.
- Meriones labradorius*, RICH., F. B.-A., i, 1829, 144, pl. 7.
- Jaculus labradorius*, WAGN., Suppl. Schreber, iii, 1843, 294.
- Meriones microcephalus*, HARL., P. Z. S., 1839, 1.
- Meriones acadicus*, DAWS., Edinb. New Phil. Journ., iii, 1856, 2, pl. 1.

A well known species of general distribution in North America, and undoubtedly occurring in the regions explored, although not represented in the collections.

FAM. MURIDÆ.

Subfamily MURINÆ.

Genus NEOTOMA, Say & Ord.

- Mus* (sp.), SAY & ORD, 1818; DESM., 1822.
- Arvicola* (sp.), HARLAN, 1825.
- Lemmus* (sp.), FISCH., 1829.
- Neotoma*, SAY & ORD, J. A. N. S. P., iv, 1825, 346, and of authors; type *N. floridana*.
- Myoxus* (sp.), RICH., Zoöl. Journ., iii, 1828, 517 (*N. cinerea*).
- Teonoma* !, J. E. GRAY (same type).

The two species occurring in the region explored may be distinguished as follows :

- I. Tail scantily hairy (nearly as in *Mus*).
 - a. Tail bicolor, barely or not as long as the body without the head.
 - Feet entirely white. Length, 9 inches or less ; tail, 6 or less . . FLORIDANA.
- II. Tail densely hairy (as in *Myoxus*), bicolor. Size of the first, or larger . . CINEREA.

NEOTOMA FLORIDANA, Say and Ord.

Wood Rat.

Mus floridana, ORD, Bull. Soc. Philom. Phila., 1818, 181.

Arvicola floridana, HARLAN, Fn. Am., 1825, 141.

Neotoma floridana, SAY & ORD, J. A. N. S. P., iv, 1825, 352, pl. x, figs. 1, 2, 3, 4.—
COUES, Proc. Acad. Nat. Sci. Phila., 1874, 175.

Lemmus floridanus, FISCHER, Syn., 1829, 299.

Neotoma mexicana, BD., P. A. N. S. P., vii, 1855, 333 ; M. N. A., 1857, 490 ; Mex. B. Surv., ii, 1859, 44, pl. 24, f. 1, a-g.—COUES, Am. Nat., i, 1867, 399.

Neotoma micropus, BD., P. A. N. S. P., vii, 1855, 333 ; M. N. A., 1857, 492 ; Mex. B. Surv., ii, 1859, 44.

HAB.—Southern United States and Northern Mexico. North to Maryland (Audubon), New York (Bell), and Massachusetts (Gibbs). Illinois, Arkansas, Kansas.

This is the ordinary species of Arizona and New Mexico ; the following one being chiefly confined to mountains, and being also more abundant farther north.

The Bush Rat (*Neotoma mexicana*) is abundant throughout the Territory, and forms no small item in the economy of the Indians. Not only the numerous tribes of the Colorado, but also the various branches of the Apache family, make great use of them as an article of food. After the destruction of Apache "rancherias," we always found, among other implements and utensils, numerous sticks, about as big as walking-canes, one end of which was bent in the shape of a hook, hardened in the fire, and a little sharpened. These, we were informed and have every reason to believe, were used to probe holes and poke about brush-heaps for rats, and to drag them out when discovered.

This statement may be doubted by those who know of the Bush Rat only as an arboreal species, building a compact globular nest of grasses and sticks in mezquite and other low, thick trees. While this is certainly the case, there is no doubt that, under different circumstances, it may live

under-ground, among rocks, or in brush-heaps. We have seen many heaps of rushes, sticks, and grasses, which could have been the work of no other animal, and formed either the nest itself, or the "vestibule" of a subterranean abode. We have also been informed to the same effect by several hunters and good observers. Dr. Kennerly has found it living under stones. It shows no tendency to modify its primitive habits by taking up its residence with man.

The food of these rats is entirely vegetable, and observers agree in noting their particular fondness for mezquite beans; both the long straight pods of the *Algarobia glandulosa*, and the curious spirally twisted fruit of the "screw mezquite" (*Strombocarpa pubescens*). As might be expected from the nature of their food, their flesh is excellent eating.

The idea of eating rats is doubtless disgusting to most persons—not Chinese nor Indian; but all such must remember that they take their notions from the House Rat, which is a dirty beast, feeding upon garbage and any decaying animal or excrementitious matter which may come in its way. The Bush Rat's food is as cleanly as that of a hare or squirrel, and there is no reason why its flesh should not be as good, as in truth we can assert it to be, having eaten it ourselves.

NEOTOMA CINEREA, (Ord) Baird.

Rocky Mountain Rat.

Mus cinereus, ORD, Guthrie's Geog., 2d Am. ed., ii, 1815, 292 (based on *ash-colored rat, with hairy tail, of the Rocky Mountains*, LEWIS & CLARK, *passim*).

Neotoma cinerea, BD., M. N. A., 1857, 499, pl. liii, f. 4.—COUES, Proc. Acad. Phila. 1874, 175.

Myoxus drummondii, RICH., Zoöl. Journ., iii, 1828, 517.

Neotoma drummondii, RICH., F. B. A., i, 1829, 137, pl. viii.

Neotoma occidentalis, COOPER'S MSS.—BD., P. A. N. S. P., vii, 1855, 335; M. N. A., 1857, 496, pl. liii, f. 3.

HAB.—Western and Northwestern North America, to the Pacific. East to Nebraska, Colorado, etc., and in British America to Hudson's Bay. South to New Mexico, Arizona, and California.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
383	<i>N. cinerea</i>	Fort Garland, Colo....	June 20, 1873	H. W. Henshaw....	In flesh.
384	.....do.....	.....do.....	.....do.....	.....do.....	Do.
8 A	.....do.....	.....do.....	Nov. 5, 1873	.....do.....	Do.
140	.....do.....	Dayton, Colo.....	Aug. 12, 1873	Dr. J. T. Fothrock..	Do.
350	.....do.....	Rio Grande, Colo.....	June 15, 1873	H. W. Henshaw....	Do.
74	.....do.....	White Mts., Arizona...	Aug. 23, 1873	Dr. C. G. Newberry.	Do.

Genus HESPEROMYS, Waterh.

Subgenus VESPERIMUS, Coues.

Musculus, RAF., Am. Month. Mag., iii, 1818, 446 (used in connection with *leucopus*, but ineligible for obvious reasons).—*Hesperomys*, BAIRD (with exclusion of *Onychomys* and *Oryzomys*).

Calomys, AUD. & BACH., Q. N. A., ii, 1851, 303 (type *aureolus*; not of Waterhouse).

Vesperimus, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 178.

CHARS.—Teeth strictly sigmodont. Back upper border of orbit not beaded (compare *Onychomys* and *Oryzomys*). Coronoid not attaining level of condyle. Cranial and dental characters in general strictly those of *Hesperomys*. Small but well-developed cheek-pouches! Of medium and small size, lithe form, and quick movement. Eyes large, prominent. Snout pointed. Ears large, rounded, thin, scantily and finely pilous; antitragus evident but not valvular. Fore feet hardly or not half as long as the hinder; palms naked; fore claws not larger than the hinder; digits slender, 3d and 4th subequal and longest, 2d and 5th successively much shorter. Hind feet long, slender; soles 6-tuberculate, naked or scant-furred on the posterior third; 2d, 3d, and 4th subequal and much the longest; 5th shorter; 1st shortest. Tail terete, slender, closely hairy, ranging in length from as long as body alone to a little longer than head and body. Pelage soft, close, glossy, with but few longer bristly hairs; feet and under parts white or whitish; body and tail more or less distinctly bicolor. No woolly tufts of hair about the ears. Type, *V. leucopus*.

HESPEROMYS (VESPERIMUS) AMERICANUS, (Kerr) Coues.**White-footed Mouse.**

American Field Mouse or Rat, PENN., Syn., 1771, No. 303; Hist. Quad., 1781, No. 302; Arct. Zoöl., i, 1784, 131.

American Wandering Mouse, BARTON, Med. & Surg. Journ. Phila., i, 1805, 31.

Mus sylvaticus, var., ERXL., Syst. Av., i, 1775, 390 (based on "New York var." of Pennant).

Mus sylvaticus var. *noveboracensis*, FISCH., Syn., 1829, 318 (the same).

Mus noveboracensis, SELYS-LONGCH., Études Microm., 1839, 67.

Mus agrarius var. *americanus*, KERR'S Linn., 1792, 231 (based on Pennant).

Mus agrarius, GODM., Am. Nat. Hist., i, 3d ed., 1860, 316 (also in the earlier editions).

Cricetus myoides, GAPPER, Zoöl. Journ., v, 1830, 204, pl. 10 (Canada).

Hesperomys myoides, BAIRD, M. N. A., 1857, 472 (Vermont, based on Gapper).

- Arvicola emmonsii*, DEKAY, Rep. Quad. Mass., 1840, 61.
Musculus leucopus, RAF., Am. Month. Mag., iii, 1818, 446.
Mus leucopus, DESM., Mamm., ii, 1822, 307; and of authors.
Hesperomys leucopus, LEC., P. A. N. S. P., vi, 1852, 413; and of authors.
Hesperomys (Vesperimus) leucopus, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 178.
Hesperomys maniculatus, WAGN., Wieg. Arch., ii, 1843, 141, and ii, 1845, 148; Abh. Akad. Wissen., v, 1848, 316 (Labrador).
Hesperomys polionotus, WAGN., Wieg. Arch., ii, 1843, 52 (Georgia).
Hesperomys campestris, LEC., P. A. N. S. P., vi, 1853, 413 (New Jersey).
Hesperomys texanus, WOODH., P. A. N. S. P., vi, 1853, 242 (Texas).
Hesperomys cognatus, LEC., P. A. N. S. P., vii, 1855, 442 (Southern States).
Hesperomys gracilis, LEC., P. A. N. S. P., vii, 1855, 442 (Northwestern States).
Hesperomys austerus, BD., P. A. N. S. P., vii, 1855, 336 (Washington Territory).
Hesperomys boylii, BD., P. A. N. S. P., vii, 1855, 335 (California).
Hesperomys gambeli, BD., M. N. A., 1857, 464 (Pacific coast, United States).
? *Hesperomys indianus*, MAXIM., Arch. f. Naturg., xviii, 1862, 111 (*fide* Allen).

NOTE.—The above synonymy is exclusive of the several geographical varieties of this species which may be recognized.

HAB.—North America generally.

Var. SONORIENSIS.

- ? *Mus leucopus*, RICH., Zoöl. Journ., iii, 1818, and F. B.-A., i, 1829, 142.
Hesperomys sonoriensis, LEC., P. A. N. S. P., vi, 1853, 413 (Sonora).
Hesperomys sonoriensis var. *nebrascensis*, BD., M. N. A., 462, in text.
Hesperomys (Vesperimus) leucopus sonoriensis, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 179.

HAB.—Interior of North America, west of the Mississippi, from Arctic regions to Mexico (usually occupying this range to the exclusion of typical *americanus*, but sometimes associated with it). This is the ordinary species of these regions, as shown by the following series of specimens:

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
87	H. leu. var. sonor.	Twin Lakes, Colo	June 11, 1873	Dr. J. T. Rothrock .	In flesh.
90	.....do .....	.....do	June 12, 1873	.....do	Do.
89	.....do .....	.....do	June 13, 1873	.....do	Do.
88	.....do .....	.....do .....	.....do .....	.....do	Do.
188 C ♀	.....do .....	.....do	Sept. 3, 1873	.....do	Do.
B 2	.....do	Fort Garland, Colo	June 5, 1873	H. W. Henshaw . . .	Do.
a	.....do .....	.....do .....	.....do .....	.....do	Do.
364	.....do	Rio Grande, Colo	June 16, 1873	.....do	Do.
75	.....do	White Mts., Arizona	Aug., 1873	Dr. C. G. Newberry.	Do.
G	.....do	Apache, Ariz . . . . .	.....do	H. W. Henshaw . . .	Do.
577	.....do .....	.....do .....	.....do .....	.....do	Do.
J	.....do .....	.....do	Aug. 21, 1874	.....do	Do.
502	.....do	El Moro, N. Mex.	July, 1873	.....do	Do.

Var. EREMICUS.

Hesperomys eremicus, BAIRD, Mamm. N. A., 1857, 479.—COUES, Am. Nat., i, 1867, 398.
Hesperomys (*Vesperimus*) *leucopus eremicus*, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 180, (valley of the Gila and Colorado).

The following species of this same section will probably be found in Arizona :

HESPEROMYS (VESPERIMUS) CALIFORNICUS, (Gamb.) Bd.

Californian Mouse.

Mus californicus, GAMB., P. A. N. S. P., iv, 1848, 78 (Monterey).
Hesperomys californicus, BAIRD, M. N. A., 1857, 478.
Hesperomys parasiticus, COOPER'S MSS.—BD., *op. cit.*, 479 (in text).
Hesperomys (*Vesperimus*) *californicus*, COUES, Proc. Acad. Nat. Sci. Phila. 1874, 180.
 HAB.—Southern and Lower California.

Subgenus ONYCHOMYS, Baird.

Hypudæus (sp.), MAXIM., Reise, ii, 1841, 99, *nec auct.*
Mus (sp.), AUD. & BACH., Q. N. A., ii, 1851, 327 (*missouriensis*).
Hesperomys subg. *Onychomys*, BAIRD, M. N. A., 1857, 458 (type *Hypudæus leucogaster*, Maxim.).—COUES, Proc. Acad. Nat. Sci. Phila., 1874, 182.

To the single known species of this genus, Dr. Coues lately added a second, discovered in Arizona. The two may be thus distinguished :

- a. Tail much less than half the head and body, scarcely twice the hind foot. Fore foot more than half the hind foot. Ear about 0.50 high. Beneath snow-white; above mouse-brown with darker dorsal area..... LEUCOGASTER.
- b. Tail nearly half the head and body, about $2\frac{1}{2}$ times the hind foot. Fore foot only half the hind foot. Ear about 0.75 high; beneath tawny white; above brownish-fulvous, without darker dorsal area (var.?) TORRIDUS.

HESPEROMYS (ONYCHOMYS) TORRIDUS, Coues.

Hesperomys (*Onychomys*) *torridus*, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 183.

DIAG.—Resembling *O. leucogaster*; tail longer, ears larger, soles less hairy, fore claws weaker. Coloration much more yellowish; no darker dorsal area; snout, feet, and all under parts tawny-white; dusky stripe on top of tail very narrow, not reaching the tip. Length of head and body, 3.75; of tail, 2.00; of fore foot, 0.40; hind foot, 0.80; ear about 0.75 above notch. Only two pair (inguinal) of teats discovered. (Type No. 9886, Mus. S. I.)

HAB.—Arizona.

Genus OCHETODON, Coues.

Mus (sp.), AUD. & BACH.
Hesperomys (sp.), WAGNER.
Reithrodon, LECONTE, P. A. N. S. P., 1853, 413.—BAIRD, M. N. A., 1857, 447; *but not of Waterhouse.*
Ochetodon, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 184 (type *O. humilis*).

OCHETODON HUMILIS, (Aud. & Bach.) Coues.

Mus humilis, AUD. & BACH., P. A. N. S. P., i, 1841, 97; J. A. N. S. P., viii, 1842, 300;
Q. N. A., ii, 1851, 103, pl. lxx (South Atlantic States).

Hesperomys humilis, WAGNER, Wieg. Arch., 1843, 51.

Reithrodon humilis, BD., M. N. A., 1857, 448.

Ochetodon humilis, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 185.

Mus lecontei, AUD. & BACH., J. A. N. S. P., viii, 1842, 307; Q. N. A., iii, 1854, 324 (no fig.), (South Carolina).

Hesperomys lecontei, WAGN., Wieg. Arch., 1843, 51.

Reithrodon lecontei, LEC., P. A. N. S. P., vi, 1853, 413.

? *Mus carolinensis*, AUD. & BACH., J. A. N. S. P., viii, 1842, 306; Q. N. A., iii, 1854, 332 (South Carolina).

? *Hesperomys carolinensis*, WAGN., Wieg. Arch., ii, 1853, 51.

? *Reithrodon carolinensis*, BD., M. N. A., 1857, 452.

Reithrodon megalotis, BD., M. N. A., 1857, 451; Rep. Mex. B. Surv., ii, pt. ii, 1859, 43, pl. vii, fig. 4 a-c, pl. xxiv, fig. 4 a-g (Sonora).

HAB.—United States, southerly. South Carolina to Texas. Kansas, Missouri, Iowa, Nebraska, Utah, Sonora.

Although not observed by the expedition, the known range of this species, as may be gathered from the foregoing, includes New Mexico and Arizona. The following species may also occur in the regions explored:

OCHETODON LONGICAUDA, (Baird) Coues.

Reithrodon longicauda, BAIRD, M. N. A., 1857, 451.—?TOMES, P. Z. S., 1861, 284 (Guatemala).

Ochetodon longicauda, COUES, Proc. Acad. Nat. Sci. Phila., 1874, 186.

HAB.—California (? south thence to Guatemala).

Subfamily ARVICOLINAE.

Genus ARVICOLA, Lacép., emend.

Mus (sp.), LINN., Syst. Nat., i, 1766, *et auct. antiq.*

Mures cunicularii, PALL., N. Sp. Glir., 1778, 77.

Lemmus, LINCK, FISCHER, *et al.*

Myodes, PALL., Zoog. R. A., i, 1811, 172 (not *Myodes* of SELYS-L., 1839, which = *Hypudæus*, KEYS. & BLAS. = *Evotomys*, COUES).

Arvicola, LACÉPÈDE, Tabl., 1803, *et auct. recent.* (includes *amphibius* and *arvalis*).

Hypudæus, ILL., Prod., 1811 (not of KEYS. & BLAS., nor of BAIRD; includes *lemmus*, *amphibius*, and *arvalis*).

Myonomes, RAFINESQUE, (type "Wilson's Meadow Mouse" = *Arvicola pennsylvanica* Ord.).

Psammomys, LEC., Ann. Lyc. N. Y., 1829, 132 (type *pinetorum*; not of RUEPPEL).

Pitymys, MCMURTRIE'S ed. Cuvier, i, 1831, 434 (type *A. pinetorum*).

Hemiotomys, SELYS-L., Études, 1839, 85 (*amphibius*, *terrestris*, etc.).

Microtus, SELYS L., Études, 1839, 86.

Pinomys, LESSON, Nouv. Tabl. R. A., 1842, 12 (type *pinetorum*).

Hemiotomys, BD., M. N. A., 1857, 515 (type *A. riparius*, ORD).

Pedomys, BD., *op. cit.*, 517 (type *A. austerus*, LEC.).

Chilotus, BD., *op. cit.*, 516 (type *A. oregonus*, BACH.).

The four sections into which the North American species of this difficult genus fall may be thus distinguished:

- A. Back upper molar with 2 external triangles and a posterior crescent.
Middle upper molar with 2 internal triangles. Front lower molar with 3 internal and 2 or 3 external lateral triangles. Ears unrimmed in front. Soles 6-tuberculate. Fore claws not longer than the hinder ones. Tail about $\frac{1}{3}$ the length of head and body, or more. Pelage ordinary. Size maximum and medium..... MYONOMES.
- B. Back upper molar with only 1 external triangle and a posterior trefoil.
Middle upper molar with 1 internal triangle. Front lower molar with 3 internal and 2 or 3 external triangles (as in *Myonomes*). Ear with a rim in front of meatus, the anterior and posterior roots of the auricle there meeting. Soles 5-tuberculate (?). Fore claws not larger than the hinder. Tail about $\frac{1}{3}$ the head and body. Pelage ordinary. Size minimum..... CHILLOTUS.
- C. Back and middle upper molars as in the last. Front lower molar with only 2 internal and 1 external triangle. Ear unrimmed. Soles 5-tuberculate. Fore claws not larger than the hinder. Tail $\frac{1}{3}$ the head and body, or rather less. Pelage ordinary. Size medium..... PEDOMYS.
- D. Molars all as in *Pedomys*. Ears unrimmed. Soles 5-tuberculate. Fore claws larger than the hinder. Tail about $\frac{1}{4}$ the head and body, or less. Pelage dense, silky, mole-like. Size small..... PITYMYS.

Subgenus MYONOMES, Raf.

Arvicola of most American writers.

Arvicola, A, *Hemiotomys*, BAIRD, M. N. A., 1857, 515 (type *riparius*. Not of Selys-L.).

Myonomes, RAF., (type *M. pratensis*, Raf., based on "Wilson's Meadow Mouse" = *A. pennsylvanica*, Ord. = *A. riparius*, Ord).—COUES, Proc. Acad. Nat. Sci. Phila., 1874, 189.

ARVICOLA (MYONOMES) RIPARIUS, Ord.

Campagnol or Meadow Mouse of Pennsylvania, WARDEN, Descr. U. S., v, 625.

Meadow Mouse, WILS., Am. Orn., vi, pl. 50, f. 3.

Arvicola pennsylvanica, ORD, Guthrie's Geog., 2d Am. ed., ii, 1815, 292 (based on the foregoing).—HARLAN, Fn. Am., 1825, 144 (in part; quotes Ord, but describes *pinetorum*).

Arvicola riparius, ORD, J. A. N. S. P., iv, 1825, 305 (Philadelphia).

Arvicola riparius longipilis, KENN., Agric. Rep. U. S. Patent Office, 1856, 304 (West Northfield, Ill.; in winter pelage).

- Arvicola xanthognatha*, HARLAN, Fn. Am., 1825, 136 (also of Godman, Say, DeKay, and Linsley, but *not* of Leach nor of Richardson).
Arvicola alborufescens, EMMONS, Rep. Quad. Mass., 1840, 60 (albino).
Arvicola hirsutus, EMMONS, *loc. cit.*
Arvicola nasuta, BACHM., J. A. N. S. Phila., viii, 1842, 296 (Massachusetts).
Arvicola oncida, DEKAY, N. Y. Fn., i, 1842, 88, pl. xxiv, f. 1 (New York).
Arvicola rufescens, DEKAY, *op. cit.*, 85, pl. xxii, f. 1 (New York).
Arvicola occidentalis, PEALE, Mamm. U. S. Ex. Ex., 1848, 45 (Puget Sound).
Arvicola californica, PEALE, *op. cit.*, 46 (California).
Arvicola montana, PEALE, *op. cit.*, 44 (California).
Arvicola edax, LEC., P. A. N. S. P., vi, 1853, 405 (California).
Arvicola borealis, LEC., *op. cit.*, 407 (Rhode Island), (not of Rich.).
Arvicola trowbridgei, BD., M. N. A., 1857, 529 (in text), (California).
Arvicola longirostris, BD., *op. cit.*, 530 (California).
Arvicola modesta, BD., *op. cit.*, 535 (Rocky Mountains), (very young).
Arvicola rufidorsum, BD., *op. cit.*, 526 (Mass.), (reddish specimen).
Arvicola breweri, BD., *op. cit.*, 525 (Muskeget, Mass.; bleached insular race).

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
185	A. (M.) riparius ..	Taylor River, Colo.....	Aug., 1873	Dr. J. T. Rothrock..	In flesh.
188 A ♀	.....do	Twin Lakes, Colo.....	Sept., 1873	.....do	Do.
188 B ♂	.....do .....	.....do .....	.....do .....	.....do	Do.
B 1	.....do .....	.....do	Aug., 1873	.....do	Do.
B 3	.....do .....	.....do .....	.....do .....	.....do	Do.
106	.....do	Fairplay, Colo.....	July, 1873	Lt. W. L. Marshall..	Do.
196	.....do	Del Norte, Colo	Sept., 1873	.....do	Do.
200	.....do .....	.....do	Oct., 1873	.....do	Do.
172	.....do	Half Moon Creek, Colo..	Aug., 1873	Dr. J. T. Rothrock..	Do.
62	.....do .....	.....do .....	.....do .....	.....do	Do.
74	.....do	White Mts., Arizona....	.....	Dr. C. G. Newberry.	Do.
742	.....do	Mount Graham, Arizona.	Oct. 19, 1874	H. W. Henshaw....	Do.

Numerous specimens attest the abundance of this species in the regions explored. Only one other is certainly known from the same portion of the continent, the *A. curtata* of Cope, a variety of *Pedomys austerus*, the synonymy of which last is also subjoined for comparison :

Subgenus PEDOMYS, Baird.

Pedomys, BD., M. N. A., 1857, 517 (type, *A. austerus*, LEC.).

For characters of this subgenus. see table, p. 106.

ARVICOLA (PEDOMYS) AUSTERUS, LeC.

Arvicola austerus, LeC., P. A. N. S. P., vi, 1853, 405 (Wisconsin).

Arvicola (Pedomys) austerus, BD., M. N. A., 1857, 532, pl. liv (Wisconsin and Missouri to Louisiana).—COUES, Proc. Acad. Nat. Sci. Phila., 1874, 190.

Arvicola (Pedomys) cinnamoma, BD., *op. cit.*, 541, pl. liv (Minnesota).

Arvicola (Pedomys) haydeni, BD., *op. cit.*, 543 (Nebraska).

HAB.—Western States and adjoining Territories, especially Illinois, Missouri, and Michigan. Kansas. Louisiana.

ARVICOLA (PEDOMYS) AUSTERUS CURTATUS, (Cope) Coues.

Arvicola curtata, COPE, Pr. A. N. S. Phila., Jan., 1868, 2 (Owen's Valley, California).

Arvicola pauperrima, COOPER, Am. Nat., ii, Dec., 1868, 535 (Washington Territory).

HAB.—United States, west of the Mississippi. California. Colorado. Kansas and Nebraska, where becoming mixed up with true *austerus*.

We ascertain, by inspection of the type specimens of both, that Dr. Cooper's species is the same as Prof. Cope's.

Genus FIBER, Cuvier.

Castor, LINN., S. N., i, 1766, 78 (not type).

Mus, GM., S. N., i, 1788 (not type).

"*Myocastor*, KERR's Linn., 1792", partly (type, *Myopotamus coypus*).

Fiber, CUV., Leçons, i, 1800 (type, *Castor zibethicus*, L.).

Lemmus, FISCHER, Syn., 1829 (partly).

Ondatra, WATERH., Charlesw. Mag., iii, 1839 (type, *O. zibethicus*).

FIBER ZIBETHICUS, (L.) Cuv.

Castor zibethicus, LINN., S. N., i, 1766, 79.

Mus zibethicus, GM., S. N., i, 1788, 125.

Myocastor zibethicus, "KERR's Linn., 1792".

Fiber zibethicus, CUV., R. A., i, 1817, 172; and of authors.

Lemmus zibethicus, FISCH., Syn., 1829, 289.

Ondatra zibethicus, WATERH., Charlesw. Mag., iii, 1839, 594.

Fiber osoyensis, LORD, P. Z. S., 1863, 95 (British Columbia).

HAB.—North America.

Found throughout entire area of North American continent. Seen by members of the expedition, but none secured. Common upon all the streams throughout the Territory of Utah; a great number being captured every year for their skins, which meet with a ready sale in Salt Lake City.

FAM. SACCOMYIDÆ.

Subfamily DIPODOMYINÆ.

Genus DIPODOMYS, Gray.

DIPODOMYS PHILLIPSI ORDI, (Woodh.), Coues.

Kangaroo Rat.

Dipodomys ordii, WOODHOUSE, Proc. Acad. Nat. Sci. Phila., 1853, 235; Sitgr. Rep. Expl. Zuni & Colorado R., 1853, 50, pl. 4.—LEC., Proc. Acad. Nat. Sci. Phila., 1853, 224.—AUD. & BACH., Q. N. A., iii, 1854, 317.—BAIRD, Mamm. N. A., 1857, 410, pl. 5, f. 1; pl. 21, f. 1; pl. 51, f. 1, 2; P. R. R. Rep., x, 1859, Gunnison's & Beckwith's routes, mamm., 8; Whipple's route, 14.—COUES, Am. Nat., i, 1867, 395.—GRAY, P. Z. S., 1868, 201.—ALLEN, Proc. Bost. Soc., 1874, 42.

Dipodomys phillipsi ordi, COUES, Proc. Acad. Phila., 1875, 326.

Dipodomys montanus, BAIRD, Proc. Acad. Phila., 1855, 334.

Common on slopes of Rocky Mountains, extending southward into Mexico, and north to the Upper Missouri.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
W	<i>D. ordii</i>	Twin Lakes, Colo.	Aug., 1873	Dr. J. T. Rothrock..	
M	.....do	Arizona	—, 1874	.....do	Alcoholic.

Subfamily PEROGNATHIDINÆ.

Genus CRICETODIPUS, Bd.

CRICETODIPUS FLAVUS, Bd.

Yellow Kangaroo Mouse.

Perognathus flavus, BD., Proc. Acad. Nat. Sci. Phila., 1855, 332; Mamm. N. A., 1857, 423, pl. 8, f. 2; pl. 21, f. 3 a-f (assigned to *Cricetodipus*).—COUES, Am. Nat., i, 1867, 397.—HAYD., Trans. Am. Phil. Soc., xii, 1862, 147.—ALLEN, Proc. Bost. Soc. Nat. His., xxii, 1874, 42.

Cricetodipus flavus, GRAY, P. Z. S., 1868, 203.—COUES, Proc. Acad. Nat. Sci. Phila., 1875, 300.

Very common throughout Utah. A number of specimens obtained. It was obtained some years since at Fort Whipple, Ariz., by Dr. Coues, who has latterly found that its range extends to British America.

Genus *PEROGNATHUS*, Maxim.*PEROGNATHUS PENICILLATUS*, Woodh.**Tuft-tailed Kangaroo Mouse.**

Perognathus penicillatus, WOODH., Proc. Acad. Nat. Sci. Phila., 1852, 200; Sitg. Rep. Expl. Zuñi & Colorado R., 1853, 49, pl. 3.—AUD. & BACH., Q. N. A., iii, 1854, 298.—BAIRD, M. N. A., 1857, 418, pl. 20, f. 5.—COUES, Am. Nat., i, 1867, 397.—GRAY, P. Z. S., 1868, 201.—COUES, Proc. Acad. Phila., 1875, 287 (monographic).

Originally described from the region embraced in the present report, of which it is a characteristic species.

Other individuals of this genus, or of *Cricetodipus*, were secured as indicated below, but have not as yet been identified.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
657	? <i>Perognathus</i> (sp.)	Arizona	Sept., 1873	Dr. O. Loew	
2	.....do	New Mexico	June, 1873	Dr. C. G. Newberry.	

? *PEROGNATHUS MONTICOLA*, Baird.

Perognathus monticola, BAIRD, M. N. A., 1857, 422, pl. 51, figs. 3 *a-h*.—SUCKL., P. R. R. Rep., xii, pt. ii, 1860, 101.—COUES, Proc. Acad. Nat. Sci. Phila., 1875, 293.

We refer to this species, with some doubt, two specimens collected by Mr. Henshaw on Otter Creek, Utah. These are apparently young animals, but, as they are not accompanied with the skulls, the point cannot be determined. Owing to their taxidermal condition, the relative proportions of body and tail cannot now be ascertained. The specimens are quite small; in a somewhat over-stuffed condition, they measure about $2\frac{1}{2}$ inches, but were probably little, if any, over 2 inches from nose to root of tail; hind foot 0.80; and in fact they resemble, at first sight, a species of *Cricetodipus* rather than of *Perognathus*. But the soles are naked, along a narrow strip, quite to the heel; the antitragus has a prominent lobe; and we determine, without appreciable risk of error, that the ear has the peculiar structure of *P. monticola*. The pelage is remarkably soft; the coloration is different from that of any other *Perognathus* we have seen, being plumbeous, with little

admixture of lighter color; while the sides show a decided fulvous stripe. But these specimens exhibit the fore leg colored quite to the wrist, and we are inclined to attribute the dark color to their immaturity. For the present, then, we provisionally assign them to *P. monticola* with a mark of doubt. The species is one with which we are still imperfectly acquainted, as may be seen on reference to Dr. Coues's memoir on the subject above cited.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
163	? <i>Perognathus monticola</i> .	Otter Creek, Utah ..	Sept. 14, 1872	H. W. Henshaw ..	Skin.
.....	do	do	do	do	Do.

FAM. GEOMYIDÆ.

Genus GEOMYS, Raf.

GEOMYS CASTANOPS, (Bd.) LeC.

Chestnut-faced Gopher.

Pseudostoma castanops, BD., Stansbury's Rep. Expl. Great Salt Lake, 1852, 313.—AUD. & BACH., Q. N. A., iii, 1854, 304.

Geomys castanops, LEC., Proc. Acad. Nat. Sci. Phila., 1852, 163.—BD., M. N. A., 1857, 384; P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, mamm., 8, pl 10, f. 2.—COUES, Powell's Expl. Colorado R., 1875, 233 (monographic).

Geomys clarkii, BAIRD, Proc. Acad. Nat. Sci. Phila., 1855, 232; M. N. A., 1857, 383, pl. 50, f. 1 a-g; U. S. Mex. B. Surv., ii, pt. ii, 1859, p. —.—KENNERLY, P. R. R. Rep., x, 1859, Whipple's Route, mamm., 13.

The original specimen of this species was taken near Bent's Fort, New Mexico. Dr. Coues has lately shown that the supposed *G. clarkii* is the same species.

Genus THOMOMYS, Maxim.

THOMOMYS TALPOIDES UMBRINUS, (Rich.) Coues.

Black-faced Gopher.

Geomys umbrinus, RICH., F. B. A., i, 1829, 202; Rep. Brit. Assoc., v, 1836 (1837), 157.—WATERH., Charlesw. Mag., iii, 1839, 596, f. 71.—DEKAY, N. Y. Fn., 1842, 92.—SCHINZ, Syn. Mamm., ii, 1845, 137.—LECONTE, Proc. Acad. Nat. Sci. Phila., 1852, 162.

Ascomys umbrinus, WAGN., Suppl. Schreb., iv, 1843, 389.

Pseudostoma umbrinus, AUD. & BACH., Quad. N. A., iii, 1854, 307.

Thomomys umbrinus, BAIRD, Mamm. N. A., 1857, 399.

Thomomys talpoides umbrinus, COUES, Powell's Exp. Col. R., 1875, 261 (monographic.)

Geomys fulvus, WOODH., Proc. Acad. Nat. Sci. Phila., 1852, 201; Sitgreave's Rep. Expl. Zuñi & Colorado R., 1853, 51, pl. 5.

Pseudostoma (Geomys) fulvus, AUD. & BACH., Q. N. A., iii, 1854, 300.

Thomomys fulvus, BD., M. N. A., 1857, 402; U. S. Mex. B. Surv., ii, pt., 1859, mamm., p. —.—KENN., P. R. R. Rep., x, 1859, Whipple's Route, mamm., 14, pl. 12, f. 2.—COUES, Am. Nat., i, 1867, 394; Proc. Acad. Nat. Sci. Phila., 1867, 135.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
484	<i>Thomomys umbrinus</i>	Provo, Utah.....	Dec. 1, 1872	Dr. H. C. Yarrow....	Skin.
761	.....do.....	Mt. Graham, Arizona..	Sept. 19, 1874	H. W. Henshaw....	Do.
739	.....do.....	.....do.....	.....do.....	.....do.....	Do.
(?)	.....do.....	.....do.....	.....do.....	.....do.....	Do.
(?)	.....do.....	.....do.....	.....do.....	.....do.....	Alcoholic.

In these specimens, we recognize fully the *Thomomys umbrinus* of Baird, as described at length by that author in the work above quoted. Professor Baird appears to refer the species to the *Geomys umbrinus* of Richardson with some doubt, in view of certain discrepancies between the subjects of his article and the description of Richardson's—a doubt apparently removed by Dr. Coues's article above cited. We present in detail the characters of our specimens.

The species is among the smaller ones of the genus. Mature specimens, excellently prepared, and thus probably giving reliable measurements, are not over six inches in length from the nose to the root of the tail, which member measures $2\frac{1}{2}$ inches. Fore foot, with longest claw, measured from the wrist, $\frac{3}{4}$ to $\frac{4}{5}$; longest claw, about 0.40. Hind foot, with claw, 1 inch, as nearly as possible. Measurements of the head cannot now be well taken; but the distance from the eye to the ear is about $1\frac{2}{5}$, with the eye nearly midway. In form, the species coincides with others of the genus.

The cheek-pouches, fully everted, are seen to be of a squarish or rather trapezoidal shape, with decided corners, like a small pillow-case. The anterior corner is quite acute; the posterior is more rounded off. The antero-posterior diameter of the pouch is something less than an inch; its depth

along the fore border is an inch, along the opposite border much less. The length of the slit leading into the pouch is an inch. These dimensions are as they appear in the dried state; in life, it will be remembered, the parts are very mobile and distensible. The pouch is thickly furry on the side next the body, more thinly so on the opposite wall. The whiskers are numerous, the longest about equaling the head, and so extremely delicate that they are best seen held up to the light. The eye is minute, about two-tenths long. The ear appears chiefly as a slight circular raised border, and is little larger than the eye. Of the fore feet, the third claw is the longest, about half the total length of the foot; the second and fourth are subequal, and about a tenth of an inch shorter; the fifth does not reach half way to the end of the fourth; the first does not attain the base of the second. All are much compressed, curved, and acute. The palm is naked; the back of the hand is clothed with bristly hairs, the longer of which overhang the bases of the claws. The soles are naked, like the palms; the hind foot is contained about two and a half times in the length of the tail; the second and third digits, with claws, are longest and subequal to each other; the fourth is considerably shorter; the first and fifth much shorter still; the latter rather the shortest. The tail is cylindric-tapering, without much enlargement at the extreme base. It is well clothed with short hairs, and contained about $2\frac{2}{3}$ times in the length of head of and body.

On viewing a dried specimen, with everted pouches, the most striking feature of coloration is observed in the contrast between the nearly pure white lining of the pouches and the sooty-blackish of the face. On the side next the body, where the pouches are most furry, they look quite white; less so on the opposite walls, where the skin shows through the scant hairs. The middle parts of the head above the snout, cheeks, and chin are sooty-blackish; in some specimens with a white throat-patch (*confer Richardson*); in others without this. This sooty color is prolonged over the nape as an obscure dark median band, and also particularly tinges the auricular region and temples. The general coloration is difficult of description, and varies, too, in different specimens. Selecting the most heavily colored example, No. 739, it is seen to be of a rich, ruddy-brown or reddish-chestnut, brightest on the sides, where it is almost "red", obscured on the back with sooty-

blackish like that of the face, which tends to form an obscurely indicated dorsal stripe, but spreads and blends so completely with the chestnut that special marking is hardly recognizable. The same rich reddish of the sides occupies with little diminished intensity all the under parts; but here it is confined to a narrower space at the ends of individual hairs, so that the dark leaden-gray of the basal parts of the hairs shows through and interrupts the continuity of the chestnut. The tail is of an indefinite dark color, sometimes whitening toward the end. The upper surfaces of both fore and hind feet are whitish, or quite purely white, in decided contrast with the body-colors.

In the other extreme, of grayness, with the same sooty-blackish face and wash on the upper parts, and the same white pouch and feet, the body-colors are notably different in lacking nearly all of the rich, ruddy-brown tints, which are chiefly apparent along the sides, especially of the head and chest. The upper parts are gray, obscured with sooty, faintly relieved with a rufous tinge; the under parts are hoary-gray, showing the darker leaden-gray of the basal part of the fur, and faintly tinged with brownish on the belly.

The third specimen, like others we have examined, is exactly intermediate between the extremes above noted. The significance of these differences remains to be ascertained. Professor Baird considered the gray state to be indicative of old age; season and sex may also influence the coloration, or much of the difference may be purely fortuitous.

The species appears to be abundant in the region where these specimens were procured. It is not necessary to suppose that Richardson's type came from anywhere in the State of Louisiana as at present mapped. "Louisiana" was formerly a very vague term, covering much ground, especially upon the labels of specimens of natural history.

NOTE.—Since the foregoing description was penned, Major Powell's Report of the Exploration of the Colorado River has appeared, containing Dr. Coues's monograph of *Geomys*idæ, which may be consulted for further account of the character and relationships of this form of *Thomomys*.

FAM. SCIURIDAE.

SCIURUS ABERTI, Woodhouse.

Tuft-eared Squirrel.

Sciurus dorsalis, WOODH., Pr. A. N. Sc. Phil., vi, June, 1852, 110 (name pre-occupied).

Sciurus aberti, WOODHOUSE, Pr. A. N. Sc. Phil., vi, Dec., 1852, 220; Sitgreave's Zuñi Exped., 1853, 53, mammals, pl. vi.—AUD. & BACH., Q. N. A., iii, 1854, 262, pl. 153, f. 1.—BAIRD, Mamm. N. A., 1857, 267.—COUES, Am. Nat., i, 1867, 355.—COUES, Proc. Acad. Nat. Sci. Phila., 1867, 134.—ALLEN, Proc. Bost. Soc., xvi, 1874, p. —.

Sciurus castanotus, BAIRD, Proc. Acad. Nat. Sci. Phila., 1855, 332 (typographical error for *castanonotus*).

Sciurus castanonotus, BD., Mamm. N. A., 1857, 266.—BD., Mex. B. Surv., ii, 1859, mammals, 35, pl. 5.

A fine specimen of this species of squirrel was obtained on the expedition of 1872 on the southern slope of Bill Williams' Mountain. Several others were secured, always in hilly districts. It was found to be very common in New Mexico and Arizona, and numerous specimens were secured during the expeditions of 1873 and 1874. One specimen was taken in Northwestern Colorado, which is probably its most northern limit.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
A 4	S. aberti.....	Tierra Amarilla, Colo..	Oct. 25, 1873	Lt. W. L. Marshall..	In flesh.
A	.....do	Camp Apache, Ariz....	Sept., 1873	Dr. Loew.....	Skin and cranium.
17	.....do	Mt. Taylor, N. Mex. ..	July 5, 1873	Dr. Newberry	Skin.
108	.....do	Bowie, N. Mex.	Oct., 1873	.....do	In flesh.
697	.....do	Apache, Ariz.	Sept., 1873	H. W. Henshaw....	Skin.
659	.....do .....	.....do .....	.....do .....	.....do	Do.
395	.....do	Santa Fé, N. Mex.	Aug., 1874	Dr. H. C. Yarrow...	Do.
394	.....do .....	.....do .....	.....do .....	.....do	Do.

These specimens are particularly interesting, as they demonstrate a hitherto unrecognized range of variation of the species. A part of them have no trace of the dorsal chestnut stripe, usually conspicuous. In this state, they are curiously similar to *Sciurus fessor*, though, of course, distinguishable by the tufted ears, dark lateral stripe, and other characters. The amount of tufting of the ears is very variable, however; the tufts being

sometimes wanting altogether in individuals that at other times possess them. This feature seems to depend mainly upon season, as the tufts are probably shed periodically. The condition of complete melanism has lately been determined to occur in this as in other species of the genus.

SCIURUS ARIZONENSIS, Coues.

Arizona Gray Squirrel.

Sciurus arizonensis, COUES, Am. Nat., i, 1867, 357 (Fort Whipple, Ariz.).—COUES, Proc. Acad. Nat. Sci. Phila., 1867, 134.

“Rather smaller than the eastern Gray Squirrel; of the same form and body-colors; the tail longer, fuller, and much broader. Ears moderate, untufted, both sides furred. Palm 5-tuberculated, nearly naked, but a little hairy on the concavities of the fingers; 4th finger longest; 3d nearly equal; 2d equal to 5th. Soles 6-tuberculated, naked to the heels, but furred rather far around on their sides; 4th toe longest; 2d and 3d nearly equal, and but little shorter. Tail to end of vertebræ equaling length of body from nose to root of tail; the hairs projecting $3\frac{1}{2}$ inches beyond terminal vertebra. Above, from nose to root of tail, a uniform mixture of gray, black, white, and tawny; the latter predominating. On the sides of the body and outside of the limbs, the tawny and black disappear, leaving a clear grizzle of gray and white. Below, from chin to anus, with the inside of the limbs, pure white, very trenchantly defined against the color of the upper parts and sides. Eyelids and cheeks, about the nose, white; woolly space at base of ears ochraceous white. The tail from above is basally of the same color as outside of thighs, the tawny of the back stopping abruptly at its base; in the rest of its extent it is black, broadly fringed with white, and having white hairs scattered sparsely through its black portion. Viewed from below, the tail is tricolor, being centrally tawny, bordered with black, which is in turn fringed with white.

“*Dimensions*.—Nose to anterior canthus of eye, 1.1 (inches and tenths); to root of tail, 9.5; tail to end of vertebræ, 9.5; to end of hairs, 13.00; its width, at broadest part, fully 6.00. Height of ear, 0.8. Longest whisker, 3.3. Palm to end of longest finger, with claw, 1.6; from olecranon to ditto, 3.6. Heel to end of longest toe and claw, 2.3; greatest width of sole, 0.7.”—(*Descr. orig.*)

This squirrel was discovered by Dr. Coues at Fort Whipple in 1865, and the single specimen then procured remains unique. Its characters cannot be reconciled with those of any other United States species known. Mr. Allen, in his late critical studies of this group, does not account for the species, though he writes us that possibly it may be the same as one of the Mexican species. In default, however, of any such identification, we continue to regard it as distinct.

SCIURUS HUDSONIUS FREMONTI, (Towns.) Allen.

Frémont's Chickaree.

Sciurus fremontii, TOWNS., *apud* AUD. & BACH., Quad. N. Am., iii, 1853, 237, pl. 149.—BAIRD, Mamm. N. A., 1857, 272.—COUES, Am. Nat., i, 1867, 356; Proc. Acad. Nat. Sci. Phila., 1867, 134.

Sciurus hudsonius var. *fremonti*, ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874, p. —.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
170	<i>S. hudsonius fremonti</i> ...	Twin Lakes, Colo.	Aug. 18, 1873	Dr. J. T. Rothrock.	Skin & cranium.
170 A	.....do .....	.....do .....	.....do .....	.....do	Do.
206	.....do .....	.....do	July 10, 1873	.....do	In flesh.
246 ♂	.....do	Chihuahua Creek, Colo.	July 4, 1873	H. W. Henshaw..	Do.
245 ♂	.....do	Fort Garland, Colo. ....	.....do .....	.....do	Do.
299 ♀	.....do .....	.....do	June 3, 1873	.....do	Do.
247 ♂	.....do .....	.....do .....	.....do .....	.....do	Do.
301	.....do .....	.....do .....	.....do .....	.....do	Do.
301 A	.....do .....	.....do .....	.....do .....	.....do	Do.
301 B	.....do .....	.....do .....	.....do .....	.....do	Do.
301 C	.....do .....	.....do .....	.....do .....	.....do	Do.
I. 1	.....do .....	.....do	Aug., 1873	Dr. C. G. Newberry	Do.
D D	.....do	Camp Apache, Ariz. ....	.....do .....	.....do	Do.
76	.....do	White Mts., Ariz. ....	.....do .....	.....do	Do.
76 a	.....do	El Moro, N. Mex.	July, 1873	H. W. Henshaw..	Do.
121	.....do	Sangre de Cristo Pass, Colo.	Aug. 9, 1874	C. E. Aiken.....	Skin.

Very numerous in mountains of Colorado, New Mexico, and Arizona. Ranges from Rocky Mountains, south of 43°, to the Pacific coast. Sixteen specimens collected in the different Territories visited.

TAMIAS QUADRIVITTATUS, (Say) Rich.

Four-striped Squirrel.

Sciurus quadrivittatus, SAY, Long's Exped. R. Mts., ii, 1823, 45.—HARLAN, Fn. Am., 1825, 180.—GRIFF., An. Kingd., v, 1827, 255.—WAGN., Suppl. Schreb., iv, pl. 204, A.

Sciurus (*Tamias*) *quadrivittatus*, RICH., Zoöl. Journ., iii, 1828, 519; F. B.-A., i, 1829, 184, pl. 16.—FISCH., Syn., 1829, 350.

Tamias quadrivittatus, WAGN., Suppl. Schreb., iii, 1843, 234.—AUD. & BACH., Quad. N. A., i, 1849, 195, pl. 24.—BAIRD, Mamm. N. A., 1857, 297.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874, p. —.

Tamias minimus, BACH., Journ. Acad. Nat. Sci. Phila., 1839, 71; Towns. Narr., 1839, 323.—WAGNER, Wieg. Arch., ii, 1843, 44.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
118	<i>T. quadrivittatus</i>	Twin Lakes, Colo....	July 26, 1873	Dr. J. T. Rothrock..	In flesh.
A 9	.....do.....	.....do.....	.....do.....	.....do.....	Do.
242	.....do.....	Fort Garland, Colo....	June, 1873	H. W. Henshaw....	Do.
242 A	.....do.....	.....do.....	.....do.....	.....do.....	Do.
242 B	.....do.....	.....do.....	.....do.....	.....do.....	Do.
242 C	.....do.....	.....do.....	.....do.....	.....do.....	Do.
242 D	.....do.....	.....do.....	.....do.....	.....do.....	Do.
27	.....do.....	Fort Wingate, N. Mex.	July, 1873	.....do.....	Do.
1104 a	.....do.....	Santa Fé, N. Mex....	June, 1874	.....do.....	Do.
1104 b	.....do.....	Arizona.....	—, 1874	.....do.....	Do.
1104 c	.....do.....	.....do.....	.....do.....	.....do.....	Do.
1104 d	.....do.....	.....do.....	.....do.....	.....do.....	Do.
1104 e	.....do.....	Mt. Graham, Ariz....	June, 1874	Dr. J. T. Rothrock..	Do.
1104 f	.....do.....	.....do.....	.....do.....	.....do.....	Do.
1104 g	.....do.....	.....do.....	.....do.....	.....do.....	Do.

First seen at Provo, Utah, and thence westward into Eastern Nevada and throughout Southern Utah.

Widely distributed throughout the West from Rocky Mountains to the Pacific coast. Very numerous in mountains of Colorado, where a number of specimens were secured.

TAMIAS QUADRIVITTATUS PALLIDUS, Allen.

Pale Four-striped Squirrel.

Tamias quadrivittatus var. *pallidus*, ALLEN, Proc. Bost. Soc. N. H., xvi, 1874, p. —.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
463	<i>T. quadrivittatus pallidus</i>	El Moro, N. Mex....	July 25, 1873	H. W. Henshaw	In flesh.
.....	.....do.....	Apache, Ariz.....	Aug. 23, 1873	.....do.....	Do.

TAMIAS QUADRIVITTATUS DORSALIS, (Baird) Allen.

Gila Chipmunk.

Tamias dorsalis, BAIRD, Proc. Acad. Nat. Sci. Phila., 1855, 332; Mamm. N. A., 1857, 300; U. S. Mex. B. Surv., ii, pt. ii, 1859, mamm., 37, pl. 6, f. 1.—COUES, Am. Nat., i, 1867, 358.—COUES, Proc. Acad. Nat. Sci. Phila., 1867, 134.

Tamias quadrivittatus var. *dorsalis*, ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874, p. —.

This form, originally described from the Mimbres, and afterward found by Dr. Coues at Fort Whipple, is more distinct than the other lately recognized "varieties" of *T. quadrivittatus*; in fact, we do not feel confident that Mr. Allen's late assignment of it to this species may not require reconsideration. For the present, however, we accept this determination.

TAMIAS LATERALIS, (Say) Allen.

Rocky Mountain Chipmunk.

Sciurus lateralis, SAY, Long's Exp., ii, 1823, 46.—HARL., Fn. Am., 1825, 181.—GRIFF., An. Kingd., v, 1827, 255.—FISCH., Syn., 1829, 350.—GODM., Am. Nat. Hist., ii, 1831, 144.—WAGN., Suppl. Schreb., iv, pl. 214, B.

Arctomys (*Spermophilus*) *lateralis*, RICH., Zoöl. Journ., iii, 1828, 519; F. B.-A., i, 1829, 174, pl. 13.

Spermophilus lateralis, F. CUV., Suppl. Buffon, i, 1831, 335.—WAGN., Suppl. Schreb., iii, 1843, 252.—AUD. & BACH., Q. N. A., iii, 1853, 62, pl. 114.—BD., M. N. A., 1857, 312.—NEWB., P. R. R. Rep., vi, 1857, 57.

Otospermophilus lateralis, BRANDT, Bull. Acad. St. Petersb., ii, 1844, 379.—GIEB., Säug., 1855, 638.

Tamias lateralis, ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874, 17; Bull. Essex Inst., vi, 1874, 57, 61, 66.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
175	<i>T. lateralis</i> ...	Dayton, Colo.	Aug., 1873	Dr. J. T. Rothrock	Skin and cranium.
175 A	.....do .....	.....do .....	.....do .....	.....do	Do.
(?)	.....do	Arizona	Sept., 1873	(?)	Do.
209	.....do	Twin Lakes, Colo.	Aug., 1873	Dr. J. T. Rothrock.	Do.
A 1	.....do .....	.....do .....	.....do .....	.....do	In flesh.
A 2	.....do .....	.....do .....	.....do .....	.....do	Do.
A 3	.....do .....	.....do .....	.....do .....	.....do	Do.
A 4	.....do .....	.....do .....	.....do .....	.....do	Do.
A 5	.....do .....	.....do .....	.....do .....	.....do	Do.
A 6	.....do .....	.....do .....	.....do .....	.....do	Do.
A 7	.....do .....	.....do .....	.....do .....	.....do	Do.
250	.....do	Fort Garland, Colo.	June, 1873	H. W. Henshaw..	Skin and cranium.
232	.....do .....	.....do	Aug., 1873	.....do	In flesh.
514	.....do	Apache, Ariz	—, 1873	C. E. Aiken.....	Skin.
123	.....do	Sangre de Christo, Colo.	Aug. 10, 1874	H. W. Henshaw..	Alcoholic.

Found northward from New Mexico in Rocky Mountains (Allen). But two specimens secured from Arizona, which increases its known range southward.

SPERMOPHILUS HARRISI, Aud. & Bach.

Spermophilus harrisi, AUD. & BACH., Q. N. A., iii, 1854, 267, pl. 154, f. 1.—BAIRD, M. N. A., 1857, 313.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874.

Very numerous in Southern Utah, living among the lava-beds.

SPERMOPHILUS TRIDECIM-LINEATUS, (Mitch.) Aud. & Bach.

Striped Prairie Squirrel.

Sciurus tridecem-lineatus, MITCH., Med. Rep., xxi, 1821, 248.—DESMAR., Mammif., ii, 1822, 339.

Arctomys tridecem-lineatus, HARLAN, Fn. Am., 1825, 164.—GODM., Am. Nat. Hist., ii, 1831, 112.

Spermophilus tridecem-lineatus, AUD. & BACH., N. A. Quad., i, 1849, 117, pl. 39.—HOY, Rep. U. S. Pat. Office for 1853 (1854), agric., p. —.—KENN., Rep. U. S. Pat. Office, agric., for 1856 (1857), 74, pl. viii.—WOODH., Sitgr. Rep., 1854, 52.—BD., Stansbury's Rep., 1852, 312; M. N. A. 1857, 316.—COUES, Am. Nat., i, 1867, 361.—ALLEN, Proc. Bost. Soc., xvi, 1874, p. —; *ib.*, xvii, 1874, 43.

Arctomys hoodii, SABINE, Linn. Trans., xiii, 1822, 590, pl. xxix.—SAB., Franklin's Journal, 663.—GRIFFITH'S Cuv., iii, 1827, 186, pl. —; v, 1827, 247.—FISCHER, Synopsis, 1829, 544.—WAGNER, Suppl. Schreber, iv, pl. 210, C (no text).

Arctomys (Spermophilus) hoodii, RICH., F. B. A., i, 1829, 117, pl. xiv.

Spermophilus hoodii, F. CUV., Suppl. Buff. Mamm., 1831, 337.—PR. MAX., Reise N. A., i, 1839, 449.—WAGNER, Suppl. Schreb., iii, 1843, 251.

Écureuil de la Fédération, DESM., Mamm., ii, 1822, 339.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
141	S. 13-lineatus.....	South Park, Colo.....	Aug. 13, 1873	Dr. J. T. Rothrock.	Skin and cranium.
207	.....do.....	.....do.....	.....do.....	.....do.....	Do.
250 A	.....do.....	Fort Garland, Colo.....	June, 1873	H. W. Henshaw..	Do.
191 ♀	.....do.....	.....do.....	.....do.....	.....do.....	Do.
100	.....do.....	Twin Lakes, Colo.....	Aug. . 1873	Dr. J. T. Rothrock.	In flesh.
19	.....do.....	Tierra Amarilla, N. Mex	Oct., 1873	.....do.....	Do.

Very numerous and widely distributed on prairie from Arkansas northward to the Saskatchewan.

SPERMOPHILUS GRAMMURUS, (Say) Bach.

Line-tailed Squirrel.

Sciurus grammurus, SAY, Long's Exped. Rocky Mts., ii, 1823, 72.—HARL., Fn. Am., 1825, 182.—GRIFF., An. Kingd., v, 1827, 255.—FISCH., Syn., 1829, 350.

Spermophilus grammurus, BACH., Charlesworth's Mag., iii, 1839, 390.—WAGN., Suppl. Schreb., iii, 1843, 253.—BAIRD, Proc. Acad. Nat. Sci. Phila., 1855, 334; M. N. A., 1857, 310.—COUES, Am. Nat., i, 1867, 360.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874.

Spermophilus couchii, BAIRD, Proc. Acad. Nat. Sci. Phila., 1855, 332.—BAIRD, M. N. A., 1857, 311 (melanotic).

Spermophilus buckleyi, SLACK, Proc. Acad. Nat. Sci. Phila., 1861, 314.

NOTE.—The above synonymy is exclusive of the Pacific forms *beecheyi* and *douglassi*.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
526	<i>S. grammurus</i> ...	Arizona	Sept., 1873	H. W. Henshaw..	Skin.
626	..... do	New Mexico	Oct., 1873	..... do	Do.
706	..... do	Apache, Ariz	Sept., 1873	..... do	Skin and cranium.
	..... do	Arizona	—, 1873	..... do	Alcoholic.
	..... do .....	..... do .....	..... do .....	..... do	Do.
X	..... do	Colorado	Aug., 1873	Dr. J. T. Rothrock.	Skin.
X 1	..... do .....	..... do .....	..... do .....	..... do	Do.
	..... do	Arizona	—, 1874	H. W. Henshaw..	Alcoholic.
1105	..... do	Gallinas Creek, N. Mex..	Oct., 1874	Dr. H. C. Yarrow.	Do.

Found from Rocky Mountains to Mexico; tolerably common. Prof. S. F. Baird, in the work above quoted, states, with regard to this species, as follows: "posterior half of upper portion of back having the white replaced by pale yellowish-brown." This coloration is not at all normal, and is not seen in young specimens, but is produced by the wearing away of the upper ends of the hairs from the animal backing into his hole. This fact was carefully observed by Mr. Henshaw, who procured several fine specimens. Mr. Allen, in his paper already cited, gives *S. couchii*, Baird, and *S. buckleyi*, Slack, as synonyms of melanistic examples of this animal from Texas.

"The rocky hill-sides, covered with volcanic *débris*, in the neighborhood of Camp Bowie, Arizona, afford a home for numbers of this species, and in our collecting trips in this neighborhood we frequently saw them hurrying away to their subterranean burrows, their utmost efforts to progress rapidly

resulting in an awkward scrambling gait. Among the confused masses of rock, however, they are more at home, and pass swiftly and with little apparent effort over and among them. They are gifted with considerable curiosity, and, having gained the mouths of their retreats, will often stop and gaze for some time upon the strange form of the intrusive stranger. This trait, however, never causes them to become forgetful of their own safety, as upon the first show of hostility they disappear as if by magic. Occasionally, we noticed a burrow in the more open ground, partially screened by bushes; this, however, is rare, the broken lavaic rocks being their chosen home. Upon inquiry, we learned that this little animal was well known in this section (Camp Bowie) for its depredations on the hen-coops, its aim being the eggs, which it was often successful in carrying off. Dr. Freeman informed us that many had been taken in traps set for this purpose, and that upon one occasion he himself had detected an individual in the act of taking his departure with an egg in his mouth."—(*Henshaw.*)

Genus CYNOMYS, Raf.

CYNOMYS COLUMBIANUS, (Ord) Allen.

Arctomys columbianus, ORD, Guthrie's Geog., 2d Am. ed., ii, 1815, 292, 302 (from Lewis & Clark).

Cynomys columbianus, ALLEN, Proc. Bost. Soc. Nat. Hist., xvi, 1874, p. —.

Anisonyx brachyura, RAF., Am. Monthly Mag., ii, 1817, 45 (from Lewis & Clark).

Arctomys brachyura, HARL., Fn. Am., 1825, 304.—FISCH., Syn., 1829, 345.

Arctomys lewisi, AUD. & BACH., Q. N. A., iii, 1853, 32, pl. cvii.

Cynomys gunnisoni, BD., Proc. Acad. Nat. Sci. Phila., 1855, 334.—BAIRD, Mamm. N. A., 1857, 335.—COUES, Am. Nat., i, 1867, 362.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
339 J. V.	<i>C. columbianus</i>	Rio Grande, Colo	June, 1873	H. W. Henshaw..	In flesh.
1 A	..... do	Twin Lakes, Colo.	Aug., 1873	Dr. J. T. Rothrock.	Do.
208	..... do . . . . .	..... do . . . . .	..... do . . . . .	..... do	Skin and cranium.
176	..... do . . . . .	..... do	Aug. 18, 1874	..... do	Do.
176 A	..... do . . . . .	..... do . . . . .	..... do . . . . .	..... do	Do.
118 A	..... do . . . . .	..... do . . . . .	..... do . . . . .	..... do	Do.
118 B	..... do . . . . .	..... do . . . . .	..... do . . . . .	..... do	Do.
140	..... do	Pueblo, Colo	Oct. 14, 1874	C. E. Aiken	Do.

Very numerous in parks and plains in and near the Rocky Mountains; westward to the plains of the Columbia.

Observed in but two localities in Utah, viz, near Panquitch Lake and Dog Valley, Middle Utah. Very numerous in Dog Valley and at Twin Lakes, Colorado.

As originally suggested by Professor Baird in describing "*gunnisoni*", this species proves, with further material examined by Mr. Allen, to be the same as the *columbianus* of Say, with which *brachyura* and *lewisi* are synonymous. Specimens show a decided brick-red color above, and tinge of the same below.

Genus **ARCTOMYS**, Schreber.

ARCTOMYS FLAVIVENTER, Aud. & Bach.

Yellow-bellied Marmot.

Arctomys flaviventer, AUD. & BACH., Proc. Acad. Nat. Sci. Phila., 1841, 99; Journ. Acad. Nat. Sci. Phila., viii, 1842, 309; Quad. N. A., iii, 1853, 160, pl. 134.—BAIRD, Mamm. N. A., 1857, 343.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
36	A. flaviventer...	Georgetown, Colo.	June 16, 1873	Dr. J. T. Rothrock.	Skin and cranium.
36 A	..... do .....	..... do .....	..... do .....	..... do	Do.
359 ♀ ad.	..... do	Fort Garland, Colo.	June 4, 1873	H. W. Henshaw..	Do.
360 jun.	..... do	Rio Grande, Colo.	June 16, 1873	..... do	In flesh.
396	..... do	Santa Fé, N. Mex.	Aug., 1874	Dr. H. C. Yarrow.	Skin.

Rocky Mountains westward to the Pacific coast. Rather scarce in Colorado, where, however, several specimens were secured.

FAM. CASTORIDAE.

Genus **CASTOR**, L.

CASTOR (FIBER var. ?) CANADENSIS, Kuhl.

American Beaver.

Castor canadensis, KÜHL, Beiträge zur Zoöl., 1820, 64.—FISCHER, Syn., 1829, 288.—BD., M. N. A., 1857, 355.—COUES, Am. Nat., i, 1867, 362.

Castor americanus, F. CUV., Hist. des Mamm., 1821.—BRANDT, Beiträge Kennt. Säugt. Russ., 1855, 64, pls. i, ii, iii.

- Castor fiber*, SAY, Long's Exped. to Rocky Mountains, i, 1823, 464.—HARLAN, Fn. Am., 1825, 122.—GODMAN, Am. Nat. Hist., ii, 21.—DOUGHTY'S Cab. N. H., iii, 1833, pl. 1.—WATERHOUSE, Charlesw. Mag. N. H., iii, 1839, 598.—DEKAY, N. H. N. Y., i, 1842, 72, pl. xx.—MARCY, Rep. Red. River, 1852, 200.—WOODH., Sitgr. Rep. Zuñi & Colorado, 1854, 47.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 47.
- Castor fiber, americanus*, RICH., F. B.-A., i, 1829, 105; Zoöl. Beechey's Voy., 1839, 6.—AUD. & BACH., Quad. N. Am., i, 1849, 347, pl. xlv.
- Castor Beaver*, PENN., Hist. Quad., 1781, No. 251.—*Id.*, Aret. Zoöl., i, 1784, 98.
- Le Castor de Canada*, GEOFF. & F. CUV., Hist. Nat. des Mamm., iii, 1819.

Distributed throughout entire area of North America, in suitable localities, excepting where population has driven it away. Seen by different members of the expedition in great numbers from South Park, Colorado, south to the New Mexican boundary, near foot-hills and parks of main range.

Quite common throughout the Territory of Utah, but particularly abundant in Bear Valley, near Parowan, upon a small stream, one of the tributaries of the Sevier. Exceedingly shy, none being captured. Quite a traffic is carried on in their skins between the Indians and Mormons. A portion of one of their dams was broken down in order that their efforts to replace it might be perceived, but without success, although a careful watch was kept for two nights.

This animal is very common near Camp Verde, Ariz., in the various streams emptying into the Rio Verde, especially Beaver Creek. It also occurs at various places along the Colorado River, where cottonwoods and willows abound.

FAM. HYSTRICIDAE.

Genus **ERETHIZON**, F. Cuvier.

ERETHIZON EPIXANTHUS, Brandt.

Yellow-haired Porcupine.

- Erethizon epixanthus*, BRANDT, Mém. Acad. St. Petersb., 1835, 389, 416, pl. 1, pl. 9, f. 1-4.—SCHINZ, Syn., ii, 1845, 266.—WATERH., Nat. Hist. Mamm., ii, 1848, 442.—BAIRD, Mamm. N. A., 1857, 569.—COUES, Am. Nat., i, 1867, 531.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, June, 1874, p. —.

Several seen on the Arkansas River, and in Colorado and New Mexico.

A single individual of this species was killed by Mr. E. E. Howell of the party upon Mount Nebo, near Nephi, Utah. According to the accounts of the settlers, it is quite common in the Wahsatch range, sometimes attaining a large size.

This species appears to be perfectly distinct from the eastern one, *E. dorsatus*, which it replaces, as far as known, in North America west of the plains. It has a wide range in latitude, from Mexico to Alaska, and corresponding regions in British America. Dr. Coues lately found it quite numerous in the Rocky Mountains at latitude 49° N.

FAM. LAGOMYIDAE.

Genus LAGOMYS, Cuv.

LAGOMYS PRINCEPS, Rich.

Little Chief Hare; Pika; "Coney" of mountaineers.

Lepus (Lagomys) princeps, RICH., Zoöl. Journ., 1828, 520; Fn. Bor.-Am., i, 1829, 227, pl. 19.—BACH., Journ. Acad. Nat. Sci. Phila., vii, 1837, 354.

Lagomys princeps, WATERHOUSE, Nat. Hist. Mamm., ii, 1848, 28.—AUD. & BACH., Quad. N. A., ii, 1851, 244, pl. 83.—BAIRD, M. N. A., 1857, 619.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
97	<i>L. princeps</i>	Argentine Pass, Colo....	July, 1873	Dr. J. T. Rothrock	Skin and cranium.
124	..... do	Fort Garland, Colo.....	May, 1873	H. W. Henshaw..	Do.
124 A	..... do .....	.....do .....	..... do .....	.....do	Do.
125	..... do .....	.....do .....	..... do .....	.....do	In flesh.
125 A	..... do .....	.....do .....	..... do .....	.....do	Do.
908	..... do	Apache, Ariz	Oct., 1873	.....do	Skin and cranium.

Quite numerous in the mountains, extending, according to Richardson, from the Rocky Mountains northward to 60° 4'. It generally inhabits the higher peaks, above timber-line, in the loose lava and scoria, where it hides, but, in some latitudes, descends to the edges of valleys in the mountains, or even to the foot-hills. At latitude 49°, it was found by Dr. Coues very abundant below 5,000 feet.

FAM. LEPORIDAE.

Genus LEPUS, Linn.

LEPUS AMERICANUS BAIRDI, (Hayd.) All.

Baird's Hare.

Lepus bairdii, HAYDEN, Am. Nat., iii, 1869, 113, fig. — (Wind River Mountains).—MER-
RIAM, U. S. Geol. Surv. Terr. for 1871 (1872), 667 (Wyoming).

Lepus americanus var. *bairdii*, ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1875, 434.

A single specimen of this interesting late discovery was procured—an unexpected acquisition, largely extending the known range of the species. The specimen is recognized by its sooty-blackish ears, sharply bordered with white, giving an unusual aspect. The rump is of the same dark color.

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
122	<i>Lepus bairdi</i> ...	Mountains west of Taos, N. Mex.	Aug., 1874	Dr. H. C. Yarrow.	Skin.

LEPUS CALLOTIS, Wagler.

Jackass Rabbit.

Lepus callotis, WAGLER, Nat. Syst. Amph., 1830, 25; Isis, 1831, 511.—WAGN., Suppl. Schreb., iv, 1844, 106, pl. 233, E.—WATERH., Nat. Hist. Mamm., ii, 1848, 138.—AUD. & BACH., Q. N. A., ii, 1851, 95, pl. 63.—MARCY, Exp. Red Riv., 1854, 201.—GIEBEL, Säug., 1855, 449.—BAIRD, Mamm. N. A., 1857, 590.—COUES, Am. Nat., i, 1867, 531.—ALLEN, Proc. Bost. Soc., xvii, 1875, 435.

Lepus nigricaudatus, BENNETT, Proc. Zoöl. Soc. Lond., i, 1833, 41.—BACHM., Journ. Acad. Nat. Sci. Phila., 1839, 84.

Lepus flavigularis, WAGLER, Suppl. Schreb., iv, 1844, 106.

Lepus texianus, WATERHOUSE, N. H. Mamm., ii, 1848, 136.—AUD. & BACH., Q. N. A., iii, 1853, 156, pl. 133.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
893	<i>L. callotis</i>	San Pedro, N. Mex.	Sept., 1873	H. W. Henshaw..	In flesh.
×	.....do	Arizona	—, 1874	.....do	Alcoholic.

The commonest and most characteristic hare of the southwestern plains. Quite a number of specimens were secured; but two only were brought in.

This animal is very abundant in the southeastern portion of California, some parts of Nevada, especially the western, and in various places in the lower part of Arizona.

It has often been found in the most barren deserts, and many miles from water.

Very common throughout Utah and Nevada, forming a great part of the subsistence of the Indians; the fur furnishing clothing for the squaws in winter. In November, it is the custom of the Pah-Utes, Gosh-Utes, and Pah-van Indians to resort to a large valley near Cedar City, Utah, for the purpose of having a grand hunt, and thousands of these rabbits are thus annually slaughtered. If properly cooked, the flesh is nutritious and tender.

LEPUS CALIFORNICUS, Gray.

California Hare.

Lepus californicus, GRAY, Mag. N. H., i, 1837, 586.—BACHM., J. A. N. Sc. Phil., viii, pt. i, 1839, 86.—WAGNER, Suppl. Schreb., iv, 1844, 110.—WATERH., Nat. Hist. Mamm., ii, 1848, 131.—AUD. & BACH., N. Am. Quad., iii, 1853, 53, pl. cxii.—GIEBEL, Säugt., 1855, 450.—BAIRD, Mamm. N. A., 1857, 594.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1875, 435.

Lepus richardsonii, BACH., J. A. N. Sc., viii, i, 1839, 88.

Lepus bennettii, GRAY, Zoöl. Voy. Sulphur, mamm., 1844, 35, pl. xiv.

Found south of the Pinal Mountains, near the Gila River (?), and in Owen's Valley, California. Skins obtained.

LEPUS CAMPESTRIS, Bach.

Northern Prairie Hare.

"*Lepus virginianus*, var. ?", HARL., Fn. Am., 1825, 310 (based on Lewis & Clark).

Lepus virginianus ["HARL."], RICH., F. B. A., i, 1829, 224 (not of Harlan).—MAXIM., Reise, i, 1839, 508.

Lepus campestris, BACHM., Journ. Acad. Nat. Sci. Phila., vii, pt. ii, 1837, 349; viii, pt. i, 1839, 80 (in winter pelage).—WATERH., N. H. Mamm., ii, 1848, 127.—GIEB., Säug., 1855, 449.—BD., M. N. A., 1857, 585.—NEWB., P. R. R. Rep., vi, 1857, 63.—COOP. & SUCKL., N. H. Wash. Terr., 1860, 104, 131.—HAYD., Tr. Am. Phil. Soc., xii, 1862, 148.—MAXIM., Verz. Nord-Am. Säug., 1862, 193.—ALLEN, Bull. Essex Inst., vi, 1874, 52, 58, 61, 66.—AMES, Bull. Minn. Acad. Nat. Sci., 1874, 70.—COUES, Bull. Essex Inst., vii, 1875, 73 (monographic).—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1875, 433.

Lepus townsendii, BACH., Journ. Acad. Nat. Sci. Phila., viii, 1839, 90, pl. 2.—TOWNS., Narr., 1839, 325.—AUD. & BACH., Q. N. A., i, 1849, 25, pl. 3.

Found in mountains to the eastward of Kanab, Utah; said to be quite

common. It is, however, essentially a more northern species, reaching only to Upper California, and attaining the regions explored chiefly at higher altitudes. It is the characteristic species of the Upper Missouri region. A full account of the species is given in Dr. Coues's article above cited.

LEPUS SYLVATICUS, Bach.

Gray Rabbit; Cotton-tail.

"*Lepus nanus*, SCHREB., Säug., ii, 1792, 881, pl. 234, B. (in part).—DEKAY, N. Y. Fauna, i, 1842, 93, pl. 27, f. 1.—WAGN., Suppl. Schreb., iv, 1843, 114.

Lepus americanus, DESM., Mamm., ii, 1822, 351 (*nec* Erxl.).—HARL., Fn. Am., 1825, 193.—AUD., Orn. Biog., ii, 51, pl. —.—BACH., Journ. Acad. Nat. Sci. Phila., vii, 1837, 326, pl. 16, f. 3, 4.—THOMPS., Vermont, 1842, 48.—GODMAN, Nat. Hist., ii, 157.

Lepus sylvaticus, BACHM., Journ. Acad. Nat. Sci. Phila., viii, 1839, 78.—WATERH., Nat. Hist. Mamm., ii, 1848, 116.—AUD. & BACH., Q. N. A., i, 1849, 173, pl. 22.—WOODH., Sitgr. Exp. Zuñi & Col. Riv., 1854, 54.—MARCY, Red Riv., 1854, 200.—BAIRD, Mamm. N. A., 1857, 597.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1875, 434; and of late authors generally.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
416	<i>L. sylvaticus</i>	Fort Garland, Colo....	June, 1873	H. W. Henshaw..	Skin and cranium.
249 ♀	..... do .....	..... do .....	..... do .....	..... do	Do.
218 ♀	..... do .....	..... do .....	..... do .....	..... do	Do.
294 ♀	..... do .....	..... do .....	..... do .....	..... do	Do.
251 ♂	..... do .....	..... do .....	..... do .....	..... do	Do.
293 ♀	..... do .....	..... do .....	..... do .....	..... do	Do.
331 ♀	..... do	Rio Grande, Colo .....	..... do .....	..... do	Do.

Numerous on western plains. Large *suite* of specimens secured, mostly females.

LEPUS SYLVATICUS NUTTALLI, (Bach.) Allen. •

Sage Rabbit.

Lepus nuttallii, BACH., Journ. Acad. Nat. Sci. Phila., vii, 1837, 345.

Lepus sylvaticus var. *nuttalli*, ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1875, 434.

Lepus artemisia, BACH., J. A. N. Sc. Phila., viii, pt. i, 1839, 94.—WATERH., Nat. Hist. Mamm., ii, 1848, 126.—AUD. & BACH., Q. N. A., ii, 1851, 272, pl. 88.—BAIRD, Mamm. N. A., 1857, 602.—COUES, Am. Nat., i, 1867, 534.—MARCY, Red River, 1854, 201.

RODENTIA—LEPORIDAE—LEPUS SYLVATICUS NUTTALLI. 129

Lepus artemisiacus, WAGNER, Suppl. Schreber, iv, 1844, 114.

Lepus bachmani, WATERH., P. Z. S., 1838, 103; Nat. Hist. Mamm., ii, 1848, 124.—

BAIRD, M. N. A., 1857, 606.

Common in the Territories visited.

Found in the desert portions of Arizona near the Gila river, though very few were either seen or obtained.

Specimen.

No.	Name.	Locality.	Date.	Collector.	Remarks.
833 B	<i>L. sylvaticus nuttalli</i> .	Southern Arizona	—, 1873	H. W. Henshaw..	Skin and cranium.

A number of other specimens belonging to this family, mostly young, were secured, but have not yet been identified.

Specimens.

No.	Name.	Locality.	Date.	Collector.	Remarks.
248	<i>Lepus</i> ———?..	Fort Garland, Colo.....	June, 1873	H. W. Henshaw..	In flesh.
499 ♂ ad.	..... do	El Moro, N. Mex.....	July, 1873	..... do	Skin and cranium.
435	..... do	Fort Wingate, N. Mex...	Sept., 1873	..... do	Cranium.
410	..... do	Arizona.....	—, 1874	..... do	Skin.
122	..... do	Sangre de Cristo, Colo...	Aug. 9, 1874	C. E. Aiken	Do.
264	..... do	Pueblo, Colo	July, 1874	..... do	Do.
410	..... do	Arizona	—, 1874	H. W. Henshaw..	Do.

RECAPITULATION OF SPECIES OF MAMMALS TREATED.

Families.	Species.	Families.	Species.
Felidæ.....	3	Saccomyidæ	4
Canidæ	5	Geomyidæ	2
Mustelidæ	7	Zapodidæ	1
Procyonidæ	1	Muridæ	10
Ursidæ	2	Sciuridæ	10
Bovidæ	3	Castoridæ	1
Antilocapridæ	1	Hystriidæ	1
Cervidæ	3	Lagomyidæ	1
Phyllostomatidæ	1	Leporidæ	6
Noctilionidæ	1		
Vespertilionidæ	10	Total	73

